BUS TRANSPORTATION

a choice of two spring pressures

Yes! For the first time, mechanics can choose the spring pressure best suited for every engine without switching between various brands or types!

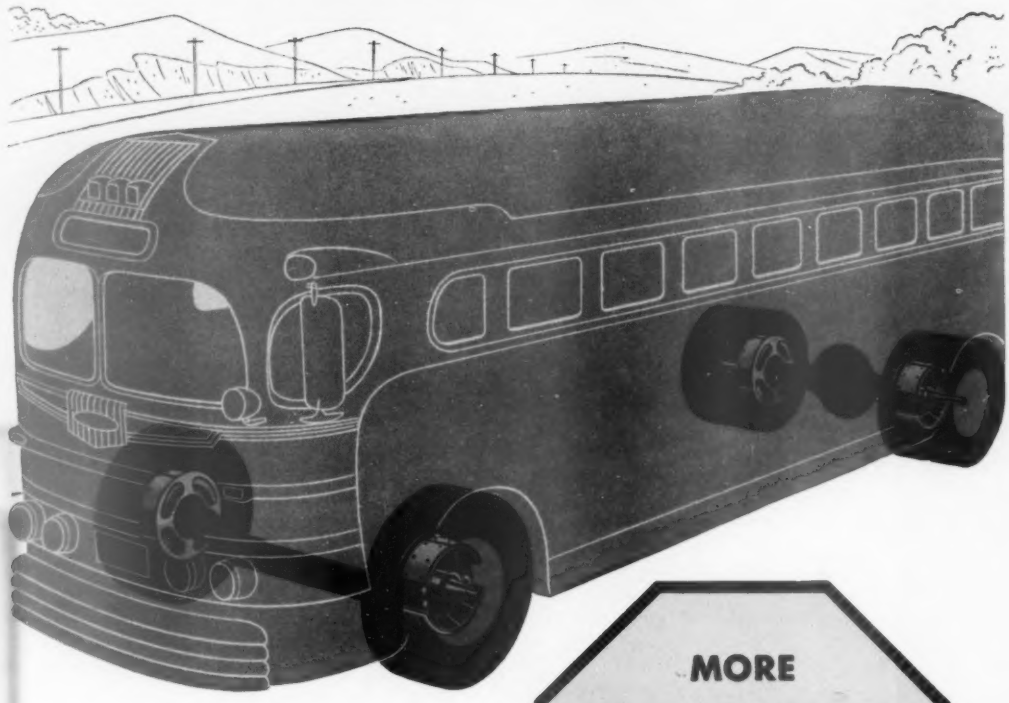
Two expander springs are packed with each Chrome Oil Stopper—a NORMAL PRESSURE spring, for use in rebored and slightly worn engines, and a HIPRESSURE spring for badly worn engines and known oil pumpers!

And there's another reason why this new set is actually *two sets in one* . . . because solid chrome plating on the top compression ring and the steel rails of the oil ring assures *twice the life* of both cylinders and rings!

The new 2-in-1 Chrome Set establishes a new high standard of piston ring performance—genuine oil economy and sustained power for thousands of extra miles. Perfect Circle Corporation, Hagerstown, Indiana.

Perfect Circle

The Most Honored Name in Piston Rings



MORE

STOPS

ON A PENNY

American Brakeblok

REG. U.S. PAT. OFF.

BRAKE LINING

Down steep grades or through city traffic, American Brakeblok Brake Lining proves its superiority. It delivers maximum mileage. Gives uniform, safe stops throughout its life. Reduces maintenance costs.

That's why leading bus and truck operators have made it first choice, for years. They *know* it gives them more stops on *their* penny. It will do the same for you.

Immediately available from your nearby NAPA Warehouse or Jobber.

AMERICAN
Brake Shoe
COMPANY

AMERICAN BRAKEBLOK DIVISION
DETROIT 9, MICHIGAN

George W. Pfeil, *Publisher*

Carl W. Stocks, *Editor Emeritus*
Earl F. Theisinger, *Executive Editor*
Frank Kane, *Managing Editor*
Cameron Day, *Assistant Editor*
Robert B. Temple, *News Editor*
R. F. Anderson, *World News Editor*
George Bryant, Jr., *Washington Editor*
Robert J. Tucker, *Art Director*

Frank Dannhauser, *Manager*

District Managers: John Knoblauch, *New York;* D. C. Taylor, *Phila.;* A. L. Meyers, W. D. Lewis, *Chicago;* A. H. Bertsch, *Cleveland;* A. T. Hapke, Jr., *Detroit;* J. W. Otterson, *San Francisco;* J. H. Allen, *Los Angeles;* R. C. Maultsby, *Atlanta;* James Cash, *Dallas.*

In This Issue . . .

• Maintenance Mobilization is the keynote today, and the problem of obtaining more miles per unit of operation is uppermost in the minds of all maintenance men in the industry.

• The "More Miles Per" articles in this issue get to the very heart of this problem. Modern shop methods, cost-cutting procedures, efficient use of tools, and the training of manpower are thoroughly discussed and evaluated in terms of their application to present day bus operation.

Next Month . . .

• The subject of zone fares has taken on new interest. Many transit industry leaders now feel that flat fares in most communities have about reached their ceiling, and that further increases in most cases will price transit out of the transportation market.

• In order to help shed light on this controversial subject, the editors of Bus Transportation are preparing a series of articles on the pros and cons of zone fares. The first article will appear in the July issue.

BUS TRANSPORTATION

CONTENTS — JUNE • 1951

More Miles Per Gallon—In Diesel Operation 39
More Miles Per Gallon—How To Save Gasoline 42
More Miles Per Tire 45
Still More Miles Per Tire—With Balanced Wheels 48
More Miles From Bearings 50
A $11 Million Bus Shop 52
Foremen are Fired—Seldom Hired 60
Saving Maintenance Dollars with Modern Shop Equipment 62
Trained Manpower is Better Manpower 66
Front End Specification Data 70
Engine Tune-Up Specification Data 71
How the Propane Fuel System Operates 77

DEPARTMENTS

Top Topics 35
Editorial 38
Association News 80
News of the Industry 84
Buyer's Guide 195
Why Controls Are Necessary 179
Advertisers' Index 24

BUS TRANSPORTATION
(With which is consolidated Bus Age)

JUNE, 1951 **VOL. 30, NO. 6**

Published monthly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948) Founder. **Publication Office 871 North Franklin Street, Chicago 10, Ill.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

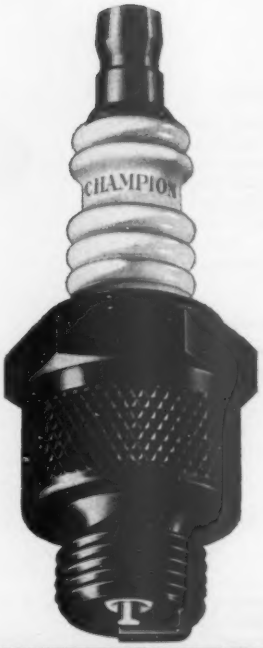
Subscription: Address correspondence to Bus Transportation—Subscription Service 330 W. 42nd St., New York 18, N. Y. Position and company connection must be indicated on subscription orders. Allow ten days for change of address.

Single copies 50c. Subscription rates—United States and possessions, $5 a year, $8 for two years, $10 for three years. Canada, $6 for one year, $10 for two years, and $12 for three years. Pan American Countries $10 for one year, $16 for two years and $20 for three years. All other foreign countries $15 for one year, $25 for two years, $30 for three years. Entered as second class matter August 27, 1948, at the Post Office, Chicago, Ill., under the act of March 3, 1879.
Printed in U. S. A. Copyright 1951 by McGraw-Hill Publishing Co., Inc. All Rights Reserved.

Articles in Bus Transportation are listed in an index made available on request at the close of each year.

"HAVE USED CHAMPIONS FOR 30 YEARS They Last Longer!"

Writes Oregon Fleet Expert



Hudson-Duncan & Co.

November 20, 1950

Champion Spark Plug Co.
Toledo 1, Ohio

Gentlemen:

I am glad to inform you that I have used Champion Spark Plugs since 1921 in racing cars and trucks and in this fleet of over 90 trucks for the last 14 years. We do not like to try and save plugs by too much cleaning and servicing and find that a Champion Plug lasts longer.

Sincerely yours,
HUDSON HOUSE, INC.

Clarence Bear
Fleet Superintendent

CB:pb

FOLLOW THE EXPERTS

SPECIFY CHAMPIONS
FOR YOUR FLEET!

CHAMPION SPARK PLUG COMPANY
TOLEDO 1, OHIO

best bet for the long pull

highest in comfort

longest in wear

lowest in maintenance

THERE are three good reasons why AIRFOAM is, more than ever, your best bet in seat cushioning:

1. AIRFOAM lasts far longer than any other type of cushioning — highly important in these uncertain times.

2. It requires virtually no maintenance — doesn't lump up or hollow out in years of severe usage.

3. Its buoyant, muscle-cradling comfort makes for easier riding, helps build good will.

Next time you order bus seats, remember these three moneysaving advantages—established in years of service on leading bus lines. Then you'll remember to specify AIRFOAM—a *good* choice any time, a *grand* choice now. For complete information on this durable cushioning, write: Goodyear, Manufacturers' Sales Dept., Akron 16, Ohio.

Quick test for real comfort

AIRFOAM gives to the lightest touch, comes back the moment pressure is lifted. It's this airy buoyancy that smothers bumps and jolts, makes AIRFOAM *so comfortable to ride or rest upon.*

Airfoam

SUPER-CUSHIONING BY

GOODYEAR

THE GREATEST NAME IN RUBBER

Airfoam—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

A DOUBLE SAVING FOR YOU

...by using TEXACO D-303 MOTOR OIL

Lubricate both heavy-duty gasoline and Diesel engines with *Texaco D-303 Motor Oil* and make this double saving:

1. REDUCE MAINTENANCE COSTS – *Texaco D-303 Motor Oil* is a fully detergent-dispersive oil. It cleans as it lubricates. Its extra-high resistance to oxidation keeps engines free from carbon, gum and sludge . . . protects bearings against corrosion. You can be sure of more mileage between overhauls . . . longer parts life and lower maintenance costs.

2. REDUCE FUEL CONSUMPTION—Because it keeps engines clean, *Texaco D-303 Motor Oil* enables you to give blow-by the go-by . . . eliminates wasted power. Fuel consumption is bound to be less.

For economies in chassis maintenance, use *Texaco Marfak*. It lasts longer, won't jar or squeeze out of bearings and gives full protection against wear and rust. *More than 400 million pounds of Marfak have been sold!*

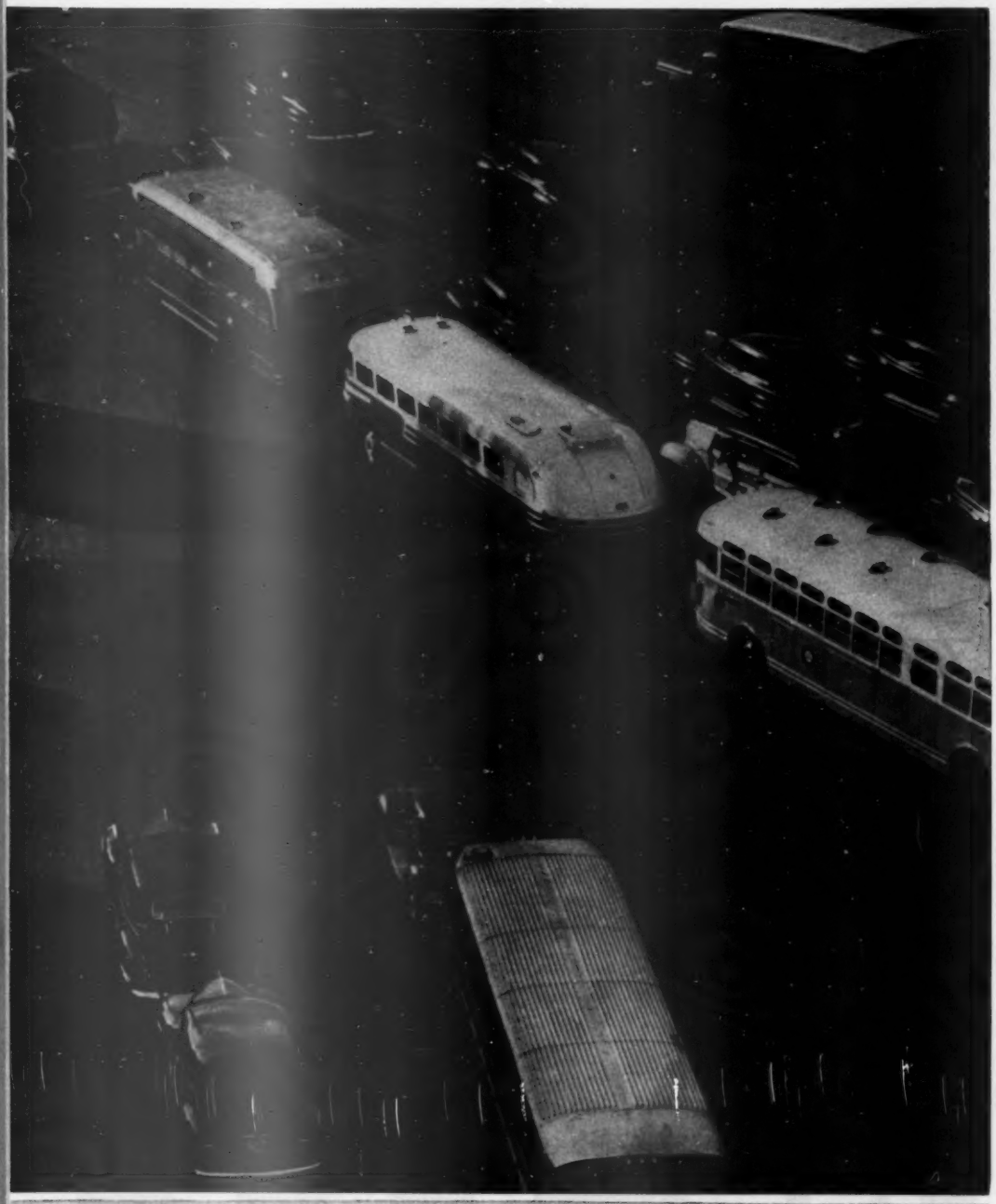
In wheel bearings use *Texaco Marfak Heavy Duty*. It seals out moisture, seals itself in, won't leak onto brakes . . . requires no seasonal change.

Let a Texaco Lubrication Engineer show you how effective lubrication will increase efficiency and cut down costs throughout your fleet. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . .
TEXACO STAR THEATER
starring
MILTON BERLE
on television
every Tuesday night.
See newspaper for
time and station.

TEXACO

TEXACO



Lubricants and Fuels

FOR THE BUS INDUSTRY

For their protection and yours!

Success in transit operation depends a great deal on the efficiency and safety of the transportation afforded the public. Thus, transit operators everywhere are constantly striving to step up efficiency, improve safety and reduce costs.

Top-notch door control equipment is, of course, enormously important in achieving these goals. That is why for over fifty years, the great majority of transit operators have specified NP Door Control and Safety Equipment for their vehicles.

NP Door Control is unsurpassed in performance and dependability. National Pneumatic's unmatched reputation for intensive research, constant development and scrupulous manufacture of door control and safety equipment is the assurance of transit operators that when they specify NP, they're getting *the best.*

Be Sure . . . Always Specify NP Door Control and Safety Equipment

NP

The Symbol of Passenger Protection

A PART OF EVERY VEHICLE . . . A PART OF ITS COST

National Pneumatic Co., Inc.

Graybar Bldg., New York • 125 Amory St., Boston 19, Mass. • McCormick Bldg., Chicago
Represented in Canada by Railway & Power Engineering Corp., Ltd., Toronto

RUB-BUB®

Heavy-Duty Platform Plate

lasts the life

of the average transit vehicle

• **BUSES GROW OLD, AND RIDERS TOO,** before Rub-Bub Heavy Duty Safety Platform Plate wears through. It lasts the life of the average bus. Tough Rub-Bub synthetic compound is a full 5/16 inch thick, and is bonded to expanded metal backing. No wonder it can take the heaviest abuse for years!

When ordinary flooring wears out, specify RUB-BUB Platform Plate. Samuel Moore & Company has a complete set of flooring templates on file for every coach make and model. And when ordering new vehicles, always specify Rub-Bub Heavy Duty Safety Flooring *throughout.*

R-4156

RUB-BUB
Transportation Products

SAMUEL MOORE & CO. MANTUA, OHIO

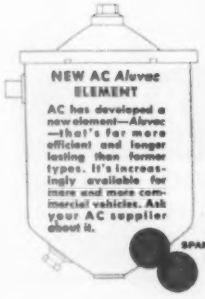
IN CANADA | SAMUEL MOORE & CO. OF CANADA, LTD.
Represented in Canada exclusively by
RAILWAY & POWER ENG. CORP.

ALSO MADE IN CANADA TO THE SAME FINE STANDARDS

AC OIL FILTERS

Protection PLUS...

AC OIL FILTER ELEMENTS
Save Your Engines and Keep 'Em Rolling


NEW AC Aluvac ELEMENT
AC has developed a new element—Aluvac—that's far more efficient and longer lasting than former types. It's increasingly available for more and more commercial vehicles. Ask your AC supplier about it.
SPARK PLUGS
FUEL PUMPS

One of the wisest moves you can make to keep your vehicles out of the shop and on the road in profit-making service, is to equip your oil filters with AC Elements.

AC Oil Filter Elements are designed to do a superior job of keeping your engines free from wear, by keeping your oil free from road dirt, dust and abrasives. They are likewise designed to lengthen the time between engine overhauls by trapping the moisture and other combustion by-products that combine with dirt to form ring-clogging, valve-gumming sludge. And operators who use them year in and year out find that they do.

AC Elements remove only dirt and other harmful substances. They do not take out refinery-added detergents or change the oil's chemical composition. There's an AC Element specifically designed for your engines. Call your AC supplier and start getting Protection *plus*.

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

FOR THE HARD JOB

GM's

Diesel Coaches

give **PERFORMANCE**

and **ECONOMY!**

51 PASSENGER

Union Street Railway Company
New Bedford, Mass.
20 MOR

HOUSTON
50 MORE
Modern Transportation for a Modern City
TRANSIT CO.
HOUSTON • TEXAS

PACIFIC ELECTRIC RAILWAY COMPANY
35 MORE

10 FOR Augusta Coach Company
1513-15 ELLIS STREET
AUGUSTA, GEORGIA
PHONES 2-04

11 MORE
CAROLINA COACH COMPANY
1201 SOUTH BLOUNT STREET
RALEIGH, N. C.

GRAY LINE BUS COMPANY
135 - 137 DOVER STREET
TELEPHONE 6-2146
BRIDGEPORT 8, CONNECTICUT
20 MORE

EDWARDS MOTOR TRANSIT COMPANY, Inc.
WILLIAMSPORT, PENNSYLVANIA
10 MOR

ROCHESTER TRANSIT CORPORATION
P.O. BOX 139
ROCHESTER 1, NEW YORK
25 MORE

LEWISTON-AUBURN TRANSIT COMPANY
15 FOR
LEWISTON, MAINE

PHILADELPHIA SUBURBAN TRANSPORTATION COMPANY
69th STREET TERMINAL
UPPER DARBY, PENNA.
25 MORE

CHICAGO & WEST TOWNS RAILWAYS, INC.
RAYMOND T. O'KEEFE, Jr., TRUSTEE
GENERAL OFFICES
LAKE STREET AND CUYLER AVENUE
OAK PARK, ILLINOIS
15 FOR

MILL-POWER SUPPLY COMPANY
15 MORE
Electrical Supplies and Equipment

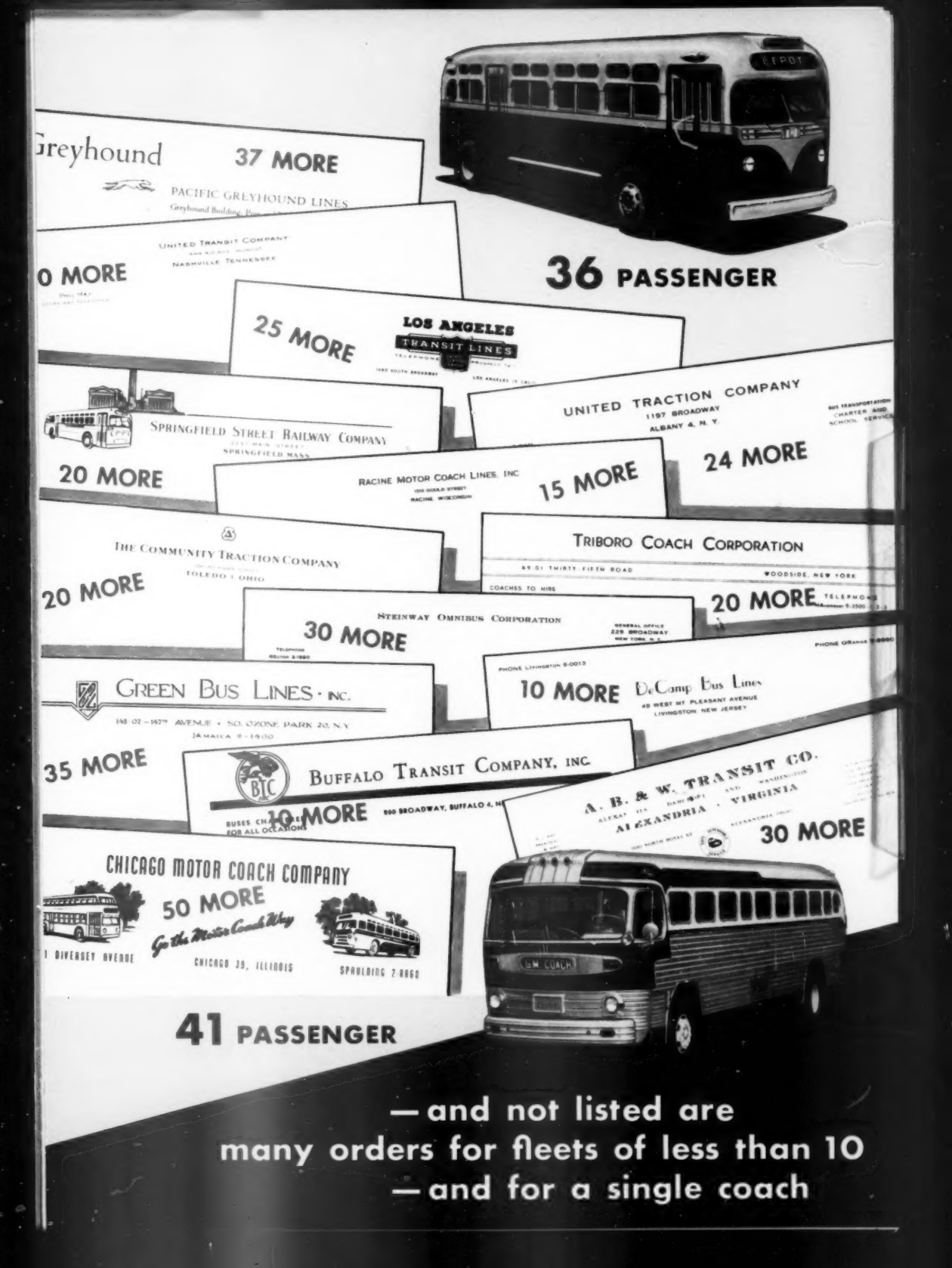
KEY SYSTEM
TRANSIT LINES
TELEPHONE OLYMPIC 2-4000
3500 HOLLIS STREET
OAKLAND 8, CALIFORNIA
25 MORE

FRIENDLY BUS SERVICE EVERYWHERE
40 MORE
Burlington Trailways
American Buslines

INDIANA RAILROAD
DIVISION OF MESSON COMPANY
Bus Service
10 MORE

20 MORE
Queen City Coach Company
Charlotte, N. C.

45 PASSENGER


Greyhound
37 MORE
PACIFIC GREYHOUND LINES
0 MORE
UNITED TRANSIT COMPANY
NASHVILLE TENNESSEE
25 MORE
LOS ANGELES
TRANSIT LINES
SPRINGFIELD STREET RAILWAY COMPANY
SPRINGFIELD MASS
20 MORE
UNITED TRACTION COMPANY
1197 BROADWAY
ALBANY 4, N. Y.
24 MORE
RACINE MOTOR COACH LINES, INC
RACINE, WISCONSIN
15 MORE
THE COMMUNITY TRACTION COMPANY
TOLEDO 1, OHIO
20 MORE
TRIBORO COACH CORPORATION
COACHES TO HIRE
20 MORE
STEINWAY OMNIBUS CORPORATION
30 MORE
GREEN BUS LINES · INC.
JAMAICA 8-1400
10 MORE
DeCamp Bus Lines
LIVINGSTON, NEW JERSEY
35 MORE
BUFFALO TRANSIT COMPANY, INC.
10 MORE
A. B. & W. TRANSIT CO.
ALEXANDRIA · VIRGINIA
30 MORE
CHICAGO MOTOR COACH COMPANY
50 MORE
Go the Motor Coach Way
CHICAGO 39, ILLINOIS
SPAULDING 2-8860
41 PASSENGER
36 PASSENGER
— and not listed are
many orders for fleets of less than 10
— and for a single coach

Only GM DIESELS WILL GIVE YOU THE ECONOMY YOU NOW NEED!

AT YOUR present rate of income and outgo, you can not afford to continue on with motor coach equipment that is costing entirely too much money to operate.

Old equipment may still have some value on your books. But it can prove a serious liability against your net income by increasing your over-all operating costs. Every mile you operate such equipment is a loss that will be hard to regain.

GM Diesel Coaches will protect you against such losses. They will operate more miles, for a longer period of time, at less money . . . returning a savings of cents per mile.

Only GM Diesels will give you the economy you now need. Nearly 600 GM Diesel coach operators will tell you this statement has been proved on their properties.

GM GENERAL MOTORS COACH

GMC TRUCK & COACH DIVISION

GENERAL MOTORS CORPORATION

PRINTED IN U.S.A.

Mobilizing Motor Transport

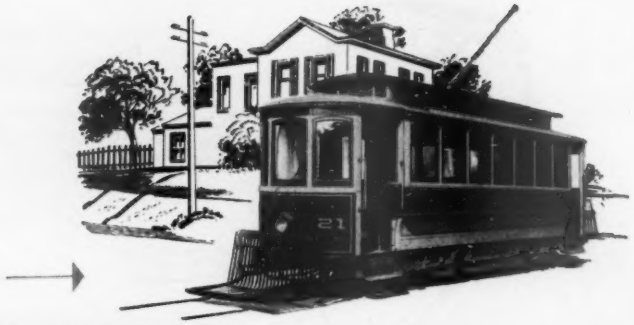
AS A PATRIOT might exclaim today, about operating a fleet: "My only regret is the loss of a single hour by any unit."

Every reduction of maintenance time . . . every added productive mile . . . every replacement saved . . . now "advances the ball" for the nation. Reason enough why lubricants considered adequate heretofore are giving way, throughout many a fleet, to extra-capable Cities Service lubricants.

Cities Service makes the exact types for all applications, from engines and gearing of all kinds, to lifts and rare special jobs. The specified lubricant at the specified time is what you'll get from Cities Service . . . keenly progressive, responsible, *and consumer-minded*. Write to CITIES SERVICE OIL COMPANY, Room 1209, Sixty Wall Tower, New York City 5. Or phone the office nearest you.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



"RAILS" WERE GOOD IN ERIE, TOO—

BUT TODAY IT'S "RUBBER" 100%!

It's been 16 years since the last streetcar rumbled down an Erie, Pennsylvania street! This bustling rail and shipping port long ago saw the many advantages of converting its streetcar service to Rubber-Tired Transit. Buses were first tried out on two routes in 1925, while today The Erie Coach Company serves the city's 130,000 residents with a fleet of 117 gasoline-powered buses.

An enthusiastic supporter of Rubber-Tired Transit is Mr. A. F. Tideswell, President of The Erie Coach Company. "We have found bus service much more economical and flexible," he says. "Routes are easily extended and changed at outer terminals to better accommodate growing areas. Where necessary, we can change to one-way traffic on any route, to keep in step with city regulations."

Keep *your* transit system in step with those of the nation's leaders by converting to versatile rubber-tired equipment. You'll cut costs—increase efficiency!

BE SURE TO SPECIFY TIMKEN-DETROIT AXLES AND BRAKES ON YOUR NEW EQUIPMENT!

All trolley coaches and the *majority* of motor buses built today are equipped with Timken-Detroit Axles and Brakes. For example, The Erie Coach Company reports that 115 of its 117 buses ride on Timken-Detroit Axles *and that they have proved very satisfactory!* You, too, will benefit from their longer life, top efficiency.

PLANTS AT: DETROIT AND JACKSON, MICH. • OSHKOSH, WIS. • UTICA, N. Y. • NEW CASTLE, PA. • ASHTABULA, KENTON AND NEWARK, OHIO

TIMKEN Detroit AXLES

A PRODUCT OF THE TIMKEN-DETROIT AXLE COMPANY
DETROIT 32, MICHIGAN

Accepted T-D Standard
TRADE MARK REGISTERED

DEVILBISS
WANT PROFESSIONAL REFINISHING?
If you paint your own vehicles, you'll want a professional job. That means the use of DeVilbiss Spray Guns, Exhaust Equipment, Air Compressors and Hose. If your vehicles go out for painting, send them to the shop which uses DeVilbiss equipment and methods. Remember, the original finish of the vast majority of motor vehicles is applied with DeVilbiss equipment.
AIR CONDITIONED
WORCESTER LIMITED

In professional painting TWO FACTS STAND OUT!

1 Finish is sprayed on

2 DEVILBISS IS FIRST!

These big "Highway Clippers" always look like new. Their clean, bright appearance is maintained at low cost with DeVilbiss Spray Painting Equipment.

The coach above is being touched up. In another part of the garage, vehicles are completely refinished. It's a professional job that saves time and expense.

Put DeVilbiss to work for you, too! Planned lighting of a DeVilbiss Spray Booth illuminates all parts of a vehicle for more uniform finishes and close detail work. The filtered air intake puts an end to dust problems, and the balanced exhaust system effectively removes fumes and overspray to further improve working conditions. The result: better quality in less time.

Let us help you keep your fleet looking factory-fresh. Our engineers have worked with leading bus, trolley coach, motor truck and motorcar manufacturers for years. Most of these and 18 out of 21 M. E. Award winners last year depend on DeVilbiss equipment extensively!

DeVilbiss products and experience are at *your* service, too.

THE DEVILBISS COMPANY
Toledo, Ohio

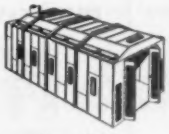
Windsor, Ontario • London, England
Santa Clara, Calif.

Branch Offices in Principal Cities

Air Compressors

Hose and Connections

Spray Guns


Spray Booths

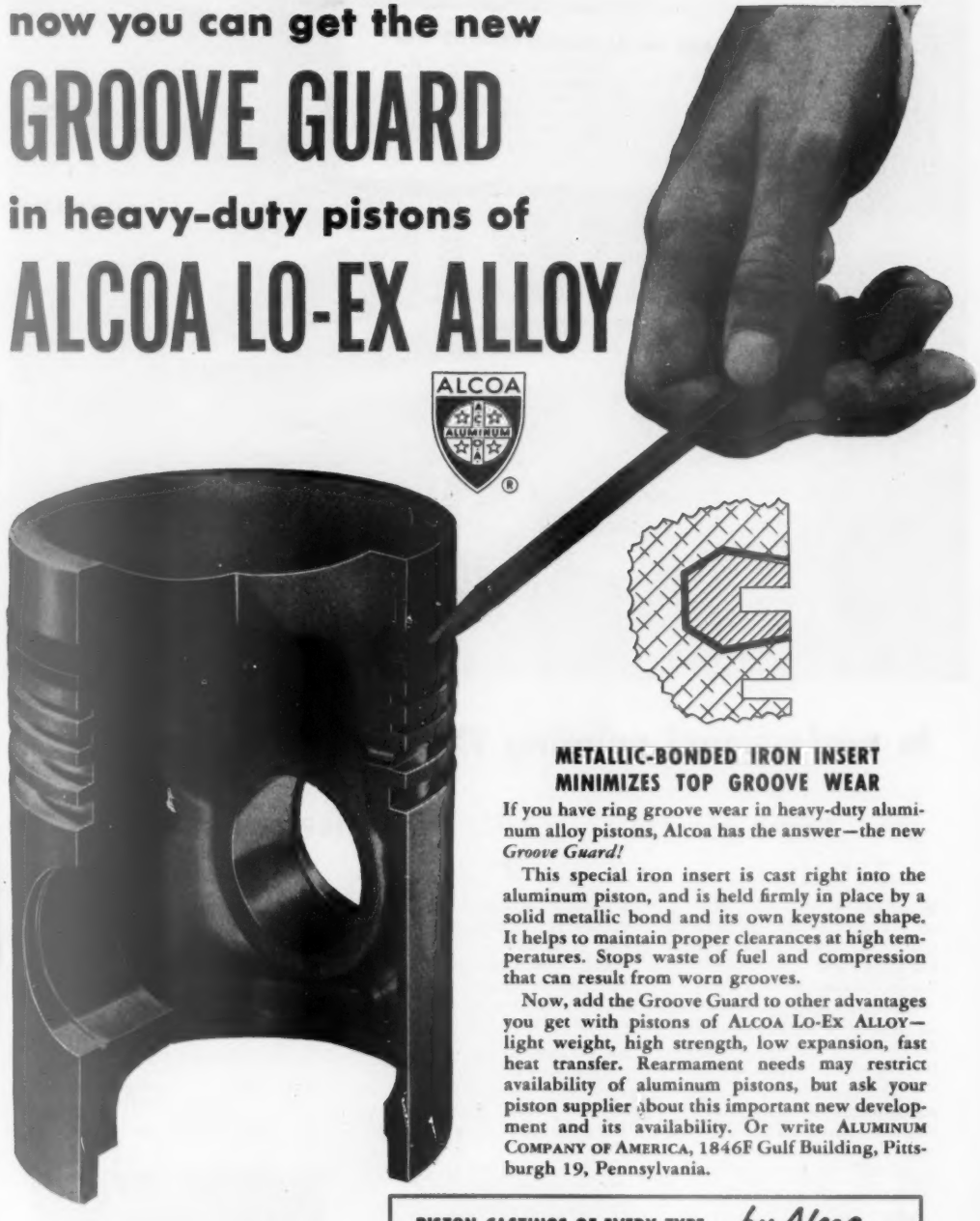
FOR BETTER SERVICE, BUY
DEVILBISS

now you can get the new

GROOVE GUARD

in heavy-duty pistons of

ALCOA LO-EX ALLOY



METALLIC-BONDED IRON INSERT MINIMIZES TOP GROOVE WEAR

If you have ring groove wear in heavy-duty aluminum alloy pistons, Alcoa has the answer—the new *Groove Guard!*

This special iron insert is cast right into the aluminum piston, and is held firmly in place by a solid metallic bond and its own keystone shape. It helps to maintain proper clearances at high temperatures. Stops waste of fuel and compression that can result from worn grooves.

Now, add the Groove Guard to other advantages you get with pistons of ALCOA LO-EX ALLOY—light weight, high strength, low expansion, fast heat transfer. Rearmament needs may restrict availability of aluminum pistons, but ask your piston supplier about this important new development and its availability. Or write ALUMINUM COMPANY OF AMERICA, 1846F Gulf Building, Pittsburgh 19, Pennsylvania.

MORE HAUL PER OVERHAUL!

PISTON CASTINGS OF EVERY TYPE... *by Alcoa*

T-Slot | Trans-Slot | Strut | Trunk Type

Steering AT ITS BEST

BECK 5000 Series MAINLINER

ROSS BRINGS EASE . . . AND ECONOMY

NEW comfort for passengers and driver . . . maximum safety . . . easy loading and unloading . . . built for gruelling service . . . and faithful, economical, profitable operation. Beck's fine new Mainliner provides all these outstanding features . . . plus the *finest in Steering—ROSS.*

The Ross policy of incorporating advancements in design as they are proved by exhaustive tests has resulted in many recent improvements. Current Ross models have:

(1) ***Increased mechanical reduction*** . . . (2) ***More compactness*** . . . (3) ***Reduction in weight*** . . . (4) ***Greater arm angular-travel*** . . . (5) ***Improved metallurgy*** . . . (6) ***Increased efficiency.***

Throughout 44 years of leadership in this industry, Ross gears have been distinguished for long life, simplicity of adjustment and maintenance of long-recognized qualities of safety, stability and performance. We invite discussion of any steering problem.

Ross

Cam & Lever **STEERING**

ROSS GEAR AND TOOL COMPANY • LAFAYETTE, INDIANA

Copenhagen first began to experience the fuel economy of the Leyland diesel when a number of these engines were installed in single-decked buses of the municipal fleet. As a result of the change-over, fuel costs were reduced from around 35 ore to 6 ore per kilometre. Such saving in fuel costs has, not unnaturally, led to a wider use of the Leyland product in the City's transport. Not only are more engine conversions taking place, but today 24 single-deckers—Comets, Tigers and the under-floor Royal Tiger—are incorporated in the fleet. Thus, we are able to include Denmark's capital to the growing number of capital cities of the world whose transport problems are in some measure being dissipated by the almost monotonous reliability and consistently low operating costs of Leyland vehicles.

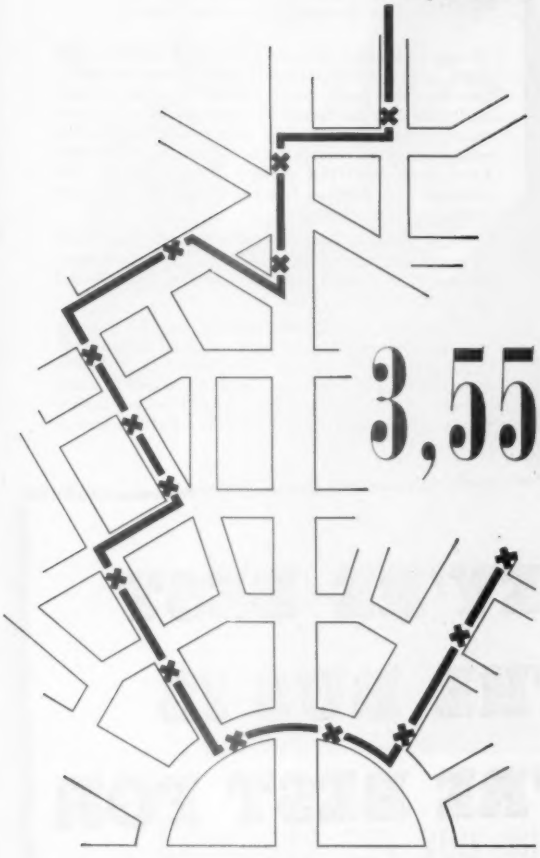
Leyland

LEYLAND MOTORS LIMITED
HEAD OFFICE & WORKS · LEYLAND · LANCS · ENGLAND
EXPORT DIVISION · HANOVER HSE · HANOVER SQ · LONDON W.1

Canadian Factory: LEYLAND MOTORS (CANADA) Ltd., LONGUEIUL, QUEBEC, CANADA

335-1/50

AMERICA'S BUSES HAVE TO MAKE A LOT OF STOPS* TO GO 3,550,000,000 MILES!



*When you consider the tremendous number of stops made by America's buses while rolling up 3,550,000,000 miles annually, it's easy to see why bus operators demand the finest brakes money can buy. Follow their lead, install dependable, economical Bendix-Westinghouse Air Brakes—the world's safest power-to-stop.

THE BEST BRAKE IS AIR

BENDIX-WESTINGHOUSE AIR BRAKES

REG. U. S. PAT. OFF.

THE BEST AIR BRAKE IS Bendix-Westinghouse

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY
ELYRIA, OHIO

Unequalled wear-resistance

(Another reason why TIMKEN bearings are first choice with bus manufacturers)

To assure longest life and freedom from wear, the cups, cones and rollers of Timken® tapered roller bearings are made from Timken fine alloy steel and then case-hardened in rotary carburizing furnaces like those at the left. As a result, they have a tough, shock-resisting core and an incredibly hard, wear-resisting surface. That's one of the reasons why Timken bearings provide maximum load-carrying capacity.

Only Timken bearings give you all these advantages: (1) advanced design, (2) precision manufacture, (3) rigid quality control, (4) special analysis steels.

Make sure the tapered roller bearings you use for replacements are always marked "Timken". And send now for the free booklet, "Timken Tapered Roller Bearings, Their Care and Maintenance". Write Dept. TB-6, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

SINCE THEY'RE BEST WHEN THE BUS IS NEW, THEY'RE BEST FOR REPLACEMENT, TOO!

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⟦⟧ AND THRUST →⟦⟧← LOADS OR ANY COMBINATION →✳←

Expenses got you pinned to the wall?

BEFORE high operating costs get you backed against the wall why not consider how much you might save by using Quaker State HD Oil.

Figured on the basis of long-run economy . . . long-run dependability . . . long-run performance, Quaker State HD Oil saves plenty. Repair bills . . . cost-per-mile expenses . . . equipment maintenance figures all can be lowered when all your equipment gets proper lubrication.

Especially tailored for heavy-duty use, Quaker State HD Oil is made from 100% pure Pennsylvania grade crude oil and it is compounded with chemical detergents of highest quality.

However tough the operating conditions, Quaker State HD Oil stays on the job lubricating, protecting, cushioning every friction surface. Moreover, it prevents the formation of sludge, gum or varnish—actually cleans as it lubricates. Try it!

QUAKER STATE OIL REFINING CORPORATION, OIL CITY, PA.

Faster Service • Better Service • Lower Cost Service

● Wherever you are in the United States or Canada, there's a Marmon-Herrington Motor Coach dealer near you—ready at all times to give you fastest possible parts and maintenance service, at lowest possible cost.

First of all, your Marmon-Herrington Motor Coach dealer carries a very large and complete stock of genuine factory replacement parts. In addition, his traveling service men call on you at frequent intervals, prepared to give you any and every assistance needed to keep your coaches performing at peak efficiency.

All of this adds up to a minimum of down time . . . *fewer hours* in the shop—*more hours* on the job . . . the only place where your motor coaches can make money for you.

Of all motor coach manufacturers, only Marmon-Herrington offers this kind of nation-wide service—one of the big reasons why Marmon-Herrington Motor Coaches have been so widely and enthusiastically accepted in their very first year—why more than 600 have been purchased by 95 operators in 34 states, Canada and Alaska—why 29 operators have already placed one or more repeat orders.

A demonstration will convince you that Marmon-Herrington Motor Coaches are the very finest in the 27-35 passenger field. See your nearby Marmon-Herrington dealer—or write for complete literature.

Transit Equipment Division • **MARMON-HERRINGTON COMPANY, INC.** • **INDIANAPOLIS 7, INDIANA**

Builders also of Marmon-Herrington Trolley Coaches for Mainline Service

and Service

National Dealer Organization

New England Marmon-Herrington Coaches, Inc.
70 New Cross Street — Phone: Somerset 6-6300
Somerville 45, Massachusetts

Fort Lee Motors, Inc.
454 Main Street — Phone: Fort Lee 8-4040
Fort Lee, New Jersey

Capital Marmon-Herrington Coaches, Inc.
611 Rhode Avenue, N. W. — Phone: National 7125
Washington 4, D. C.

Central States Marmon-Herrington Sales
3480 Lee Road — Phone: Skyline 1-6311
Cleveland 20, Ohio

Great Lakes Marmon-Herrington Coach Co.
14401 Michigan Avenue — Phone: Logan 3-7500
Dearborn, Michigan

Northwest Marmon-Herrington Coaches, Inc.
1518 West National — Phone: Evergreen 4-6200
Milwaukee 4, Wisconsin

Midwest Marmon-Herrington Coaches, Inc.
6185 Delmar Blvd. — Phone: Parkview 8685
St. Louis 12, Missouri

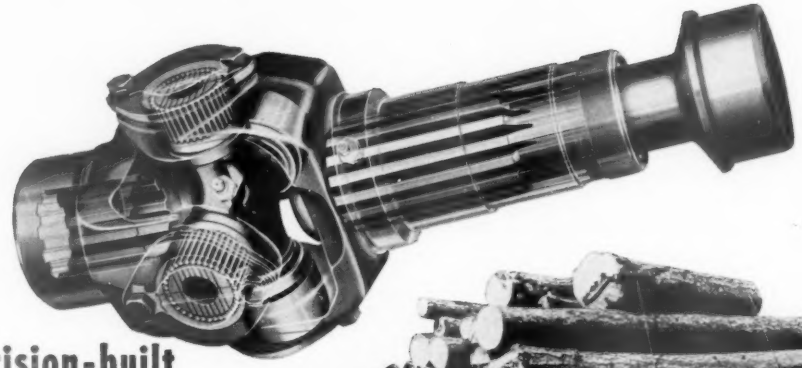
Southeast Marmon-Herrington Coaches, Inc.
102 East 14th St. — Phone: 3-8605
Jacksonville 6, Florida

Southwest Marmon-Herrington Coaches, Inc.
4147 Commerce Street — Phone: Yaupon 3117
Dallas 1, Texas

Pacific Marmon-Herrington Coach Sales
2500 East 12th St. — Phone: Trinity 4925
Los Angeles 21, California

Cole Commercial Company, Inc.
3423 Fourth Ave., South — Phone: Sumner 1412
Seattle 4, Washington

Made in Canada by
Welles Corporation, Ltd., Windsor



precision-built

performance-proved

BEST for heavy-duty bus service

THE LOGGING INDUSTRY, using Spicer Universal Joints in equipment that hauls immense log loads, has proved the exceptional ruggedness of Spicer Universal Joints.

No service in the bus industry could be more punishing than heavy log-hauling up and down steep, tortuous mountain roads!

Exclusive Spicer features of special benefit to the bus industry include:

RIGID one piece forged steel yokes and journal cross

HEAT-TREATED steel forgings

PRECISION fits and surface finishes

DYNAMIC and static balance in all units

POSITIVE lubrication by centrifugal action

TYPES and sizes for every need in the bus industry

Spicer engineering has a world-wide reputation for the breadth of its experience . . . for its ability to analyze power transmission problems . . . and its precise engineering, designing and manufacturing abilities.

47 YEARS OF Spicer SERVICE

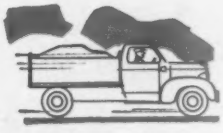
SPICER MANUFACTURING • *Division of Dana Corporation* • **TOLEDO 1, OHIO**

TRANSMISSIONS • CLUTCHES • PARISH FRAMES • POWER TAKE-OFFS • PROPELLER SHAFTS • SPICER "BROWN-LIPE" GEAR BOXES • STAMPINGS • FORGINGS • UNIVERSAL JOINTS • TORQUE CONVERTERS • PASSENGER CAR AXLES • RAILWAY GENERATOR DRIVES

Johns-Manville Information Service Bulletin J-M 101

Prepared by the Automotive Friction Material Division

Notes on the heat-checking of brake drums



With today's heavier loads and faster road speeds placing more severe demands on brakes, there has been an increase in drum failure due to heat checking.

This dangerous and expensive evil usually appears first in the form of hair-line cracks across the friction surface. Each of these fine cracks tends to increase in length and depth for as long as unfavorable conditions exist. Failure comes in a drum that has been so weakened by cracks that it eventually breaks in several places at the instant of a sudden brake application.

Fatigue brings fracturing

Heat checking is probably due to a form of fatigue in the drum metal. During a heavy application of the brakes, the temperature of the friction surface of the drum may rise suddenly to a very high figure, while opposite surfaces, which are exposed to the outside air, remain cool. This great difference in temperature, occurring within a thin cross-section of metal, sets up severe strains.

The cracks which appear initially are too fine to be detected by the naked eye. However, repetitions of the severe heating-cooling cycle cause the cracks to expand and progress until fracturing occurs.

In recent years, the heat-checking of brake drums has become such an important problem that Johns-Manville designed and built a special laboratory machine for quickly determining the tendency of a brake block to cause drum cracking. This machine runs day and night at the Johns-Manville Research Laboratory, producing a wealth of data that is proving immensely valuable to friction materials engineers. It has been found, for instance, that some brake lining structures—notably those which are slightly resilient—will greatly reduce the tendency toward heat checking of drums and give considerably longer lining service life as well.

Balance is important

It has also been found that correct "balance" of a brake system is extremely important in eliminating drum failure. If the brakes on one wheel are doing more than their share of work, that drum will naturally be subjected to abnormal temperature changes during heavy braking periods. If one drum on a vehicle is a chronic heat checker, it is usually a signal that it is doing more work than it should.

REMEMBER, it is cheaper to replace brake linings than drums . . . in fact it is often 2 to 1 in favor of the lining.

If you would like to know more about Johns-Manville friction materials designed especially for heavy-duty brake service, write for your copy of "*The Fleet Reliner's Manual.*" Address: Johns-Manville, Box 290, New York 16, New York.

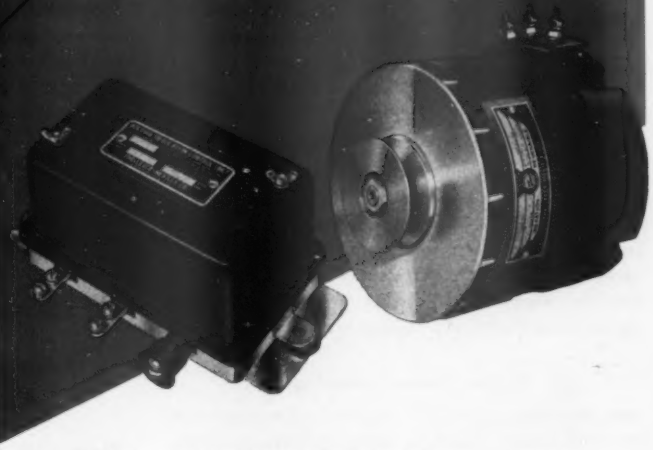
Watch for the next Information Service Bulletin by Johns-Manville, to appear soon in this publication.

Johns-Manville *Asbestos* FRICTION MATERIALS

BRAKE LININGS • BRAKE BLOCKS • CLUTCH FACINGS

You get 5 proven advantages

when you use the Leece-Neville ALTERNATOR System



1. Surplus Amperage under absolute control at all truck speeds.
2. Fully charged batteries—no over charging.
3. All electrical units protected, yet operate at maximum efficiency.
4. Long-life assurance to all electrical units.
5. Infrequent maintenance—low cost operation.

There is an L-N electrical system to serve every requirement. Dependability and economy are the inevitable result of their use. Don't operate with less than the best—L-N. Correspondence invited.

Today your vehicles deserve a better electrical system...a system that for years has held the highest reputation for dependable heavy duty performance: The L-N Alternator System.

The modern need for more amperage is soundly provided through the exclusive L-N Alternator System—available in units serving from 60 up to 175 amperes. For years it has been serving in thousands of units operating over the toughest and hilliest routes in America.

The "watch dog" of this great electrical system, the patented L-N Voltage Regulator, has all the L-N characteristics of rugged design and construction, plus sensitive control that assure dependable and sufficient electrical output for every type of service.

And like all L-N electrical units, this regulator is so designed and constructed that maintenance adjustments, if and when necessary, are generally practical without recourse to complete unit replacement. ***In these days that's important.***

THE LEECE-NEVILLE CO., CLEVELAND 14, OHIO

Leece-Neville

QUALITY ELECTRICAL EQUIPMENT FOR OVER 40 YEARS

Dependable, cooperative service is available in all principal cities.

Sealed Power

PAX EBONITED PISTONS

are the only pistons made in which section of greatest wear can be replaced!

Every PAX Piston Equipped with GI-60 Contracting Groove Insert!

Every Sealed Power PAX Piston comes factory-equipped with the famous Sealed Power GI-60 Contracting Groove Insert—the only dependable, economical, long-lasting preventive of top ring groove wear!

This is a feature of vast importance to every fleet operator, because the top ring groove is the part of every piston that wears out first—the part subject to the greatest heat and the greatest pressure, and the part protected by the least lubrication.

By installing the Sealed Power GI-60 in every PAX Piston, Sealed Power has added thousands of miles of service!

Sealed Power PAX Pistons are manufactured from genuine Lo-Ex* Virgin Aluminum Alloy with silicon base, which dissipates heat most efficiently. Special Eboniting process assures smoother-running engine because piston surface is oil-impregnated, oil-absorbing. T-slot design, cam-ground, with rugged internal construction for extra strength and fast heat transfer.

*Registered trade mark of Aluminum Co. of America.

Write for name of nearest distributor

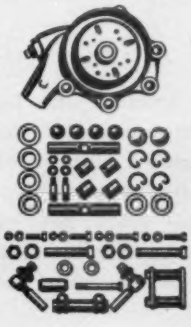
SEALED POWER CORPORATION
MUSKEGON, MICHIGAN

Always use Sealed Power parts for best results

HEAVY DUTY PISTONS—Aluminum or cast iron as indicated; exclusive T-slot design, cam ground, ruggedly designed, heat treated. Equal to or better than original equipment.

WET OR DRY SLEEVES—Machined from closely controlled castings, with exceptionally fine grain and dense molecular structure for long wear.

VALVES—Sealed Power Valves and valve parts are made from the correct grade of chrome nickel alloy steel for each engine, for finest performance and maximum service.

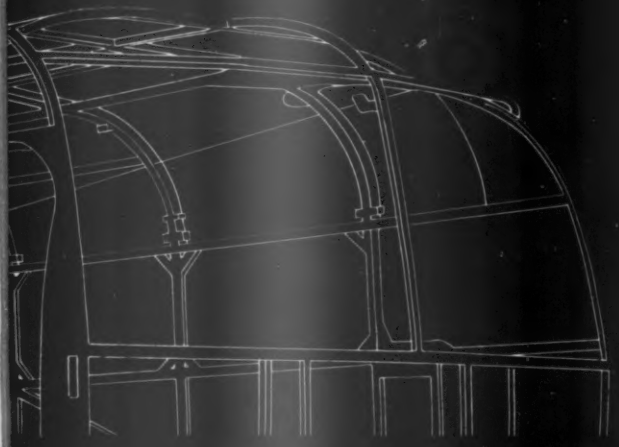


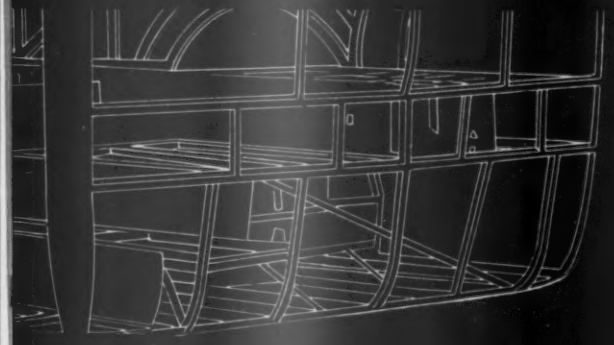
WATER PUMPS—Manufactured from finest quality materials to highest standards. Our line is complete.

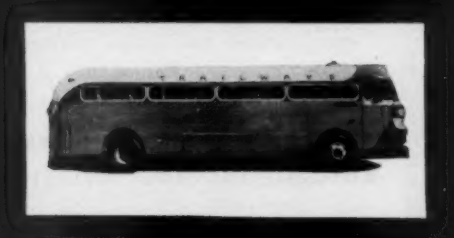
KING BOLTS & BUSHINGS—Manufactured from highest quality forgings, and heat treated to meet your exact requirements.

TIE RODS & SHACKLES—Sealed Power Tie Rods, Spring Shackles, and Front Wheel Suspension Parts meet specifications of original equipment.

TRIED
TESTED
Acrocoach






TRAILWAYS

Where Quality Counts...

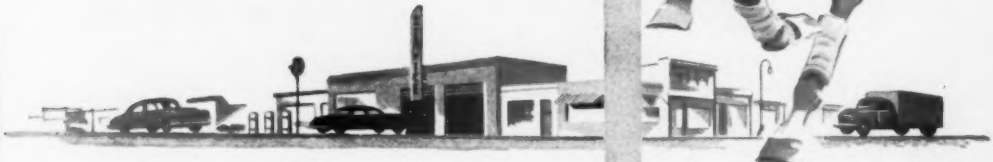
use PACKARD LOW TENSION CABLE with "249 Compound"

What a wonderful difference! Packard low tension cable with amazing "249 compound" insulation lasts longer and delivers superior performance, too.

Packard's "249 compound" insulation will not crack or harden. It has exceptional resistance to heat, chemicals, oils and abrasion. And "249 compound" will not support combustion.

By every test in the laboratory—by the test of long, hard use—Packard low tension cable gives better, longer, more trouble-free service. What's more, Packard automotive cable is used as original equipment on more cars, trucks and buses than any other make.

Yes, where quality counts, use the cable that sets the standard of the industry—Packard low tension cable.



Packard

REG. U.S. PAT. OFF.
TRADE MARK

Packard Electric Division, General Motors Corporation
Warren, Ohio

FOREMOST BUILDER OF AUTOMOTIVE AND AVIATION WIRING

PACKARD PETE SAYS—

Standardize on nationally known and widely distributed Packard automotive cables. Packard supplies highest quality cable for *all* requirements—low tension cable ... 440 and Lac-Kard high tension cable ... battery cables with your choice of the LeadAlloy terminal or the leaded brass terminal.

Ionia Model 60 Series Shown here. Other City and Intercity Models Available

Ionia SEATING

NATIONALLY RECOGNIZED FOR "RIDER COMFORT"

• Across the nation, scores of public transportation executives, like those pictured here, have indicated their approval of IONIA seats. In so doing, they recognize the importance of seating comfort to the operator and his passengers . . . and the tremendous role that the "rider-appeal" of IONIA seating plays in a transit system's successful operation. All the know-how of a quarter-century of seating experience, endless research and production skill result in the built-in comfort which has won universal recognition for IONIA seats.

IONIA MANUFACTURING CO.
AUTOMOTIVE SEATING DIVISION • IONIA, MICH.

MERIT AWARD
Ionia Manufacturing Company
Granted by the National Board of Governors for Leadership in Research, Engineering Design and Manufacture in the Bus Seating and Folding Chair Industry
American Society of Industrial Engineers

. . . AND NOW THE AMERICAN SOCIETY OF INDUSTRIAL ENGINEERS HAS SINGLED OUT IONIA SEATING FOR RECOGNITION! Pictured at the right, Don Mitchell, president of Ionia Manufacturing Co., accepts the 1951 Merit Award from Robert L. Crimnion, national president of the A.S.I.E. for "Excellence in Engineering and Manufacturing." This priceless honor is the exclusive distinction of IONIA Seating.

L. J. NOWICKI
General Manager
Dept. of Street Railways
Detroit, Mich.

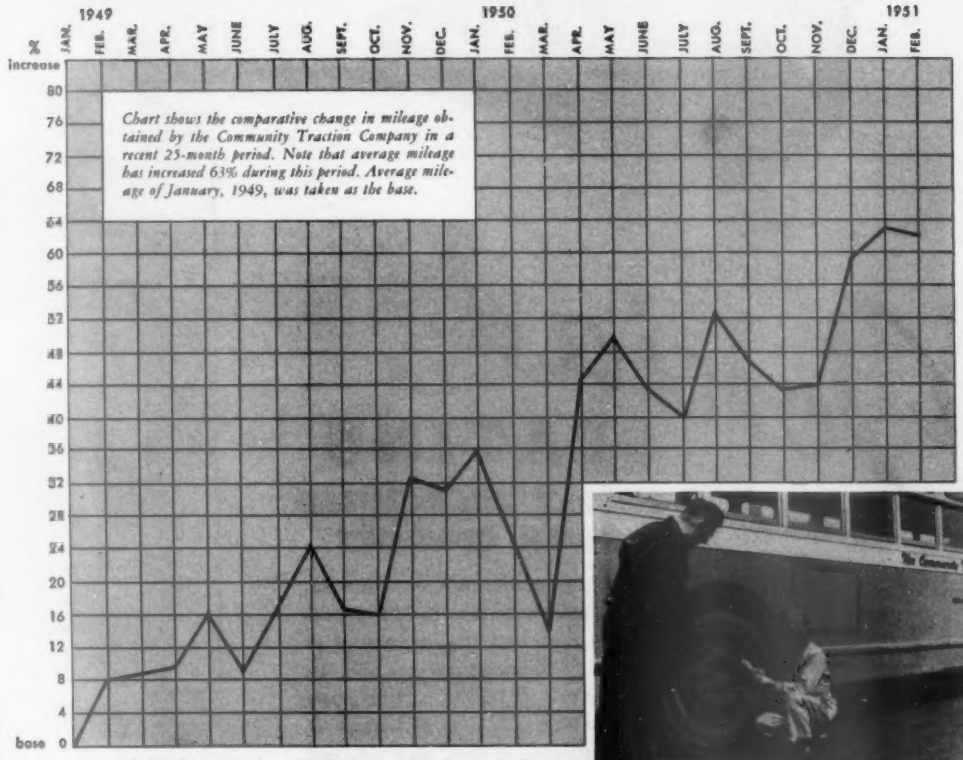
CHARLES GUERNSEY
Vice Pres. & Gen. Mgr.
Marmon-Herrington Co.
Indianapolis, Ind.

W. C. NAEGEL
General Manager
Motor Coach Division
White Motor Company
Cleveland, Ohio

J. R. McCAIN
Exec. Vice Pres.
Philadelphia Suburban
Transportation Co.
Upper Darby, Penna.

B.F.Goodrich

Bus tires with nylon shock shield boost Community Traction mileage by 63 per cent!



C. L. Minke (standing), and L. E. Burnett of the Community Traction Company, Toledo, Ohio, examine a B. F. Goodrich bus tire.

THE Community Traction Company of Toledo, Ohio, operates 267 buses approximately 8,975,000 miles annually on B.F.Goodrich Mileage C bus tires. In a recent 25-month period, Community Traction increased its mileage by 63%.

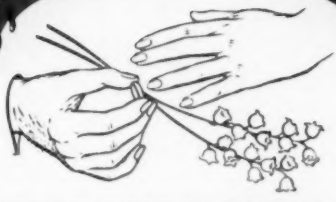
Both the B.F.Goodrich Mileage C tire, engineered to withstand the stop-start service of city routes, and the Super Highway tire, specifically designed for highway service, have extra-thick, specially-compounded treads to give you long, smooth wear. And both are built with the patented nylon shock shield—exclusive in B.F.Goodrich tires.

With the nylon shock shield, you get a 4-way saving: (1) greater average mileage (2) increased bruise resistance (3) less danger of tread separation (4) more recappable tires.

The Super Highway tire is now available with all-nylon construction to give you *double* the bruise resistance of ordinary bus tires and greater recappability. Mileage C tires have a proportionately greater road contact area than other bus tires. This means more tread rubber shares the wear.

Operators throughout the country report mileage increases, fewer road delays, and better road service—*without* additional air pressure—from B.F.Goodrich bus tires. Put BFG tires on your buses and start saving. *The B.F.Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER



"WITH THIS RING . . ."

repairmen hold customers for life!

Sealed Power

MD-50 STEEL OIL RING

The only ring with the FULL-FLOW SPRING

Controls oil even in badly tapered and out-of-round bores

Sealed Power

CHROME-FACED RING

For Triple Mileage

Latest scientific development to fight

ABRASION, FRICTION, CORROSION, HEAT

SEALED POWER CORPORATION · MUSKEGON, MICHIGAN

Sealed Power Piston Rings

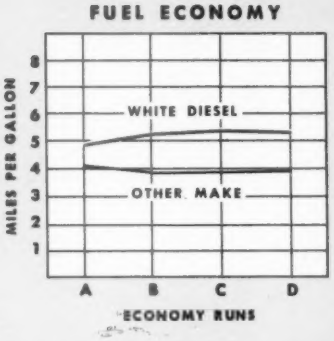
BEST IN NEW BUSES BEST IN OLD BUSES

White MEANS MAXIMUM DIESEL ECONOMY ...Anywhere

Keep your Whites in best working condition . . . for the duration!

GET ALL THE FACTS about Diesel . . . and you will see what new WHITE DIESEL ECONOMY means to your operations. Economy runs made in all parts of the country . . . under all kinds of operating conditions prove the flexibility and efficiency of the White Diesel—assure complete tailoring to exact operating requirements . . . maximum fuel economy.

Before you invest, get the facts about White Diesel economy. Let us prove its *extra* economy by a demonstration in your service.



THE WHITE MOTOR COMPANY • COACH DIVISION • 1455 E. 185th St., CLEVELAND 10, OHIO

SYMBOL OF SERVICE IN THE BUS INDUSTRY . . . *Nationwide!*

White BUSSES

BUS TRANSPORTATION

TOP TOPICS

HIGHLIGHTS OF LAST MINUTE DEVELOPMENTS IN THE BUS INDUSTRY AS WE GO TO PRESS

June, 1951

DEFENSE MOBILIZATION AGENCIES are apparently in for a shake-up. Defense Mobilizer Charles Wilson is making no radical changes in top mobilization policies, but it is clear that shifts in power are being carried out. For instance, in connection with the bus industry itself, the equipment programs under NPA will be split, buses and trolley buses to be handled by the Motor Vehicle Division of NPA, street cars by the Railroad Equipment Division of the same agency. DPA is being trimmed down by transferring major functions to other agencies. Control of CMP goes to NPA. Up to now, NPA has had to look to DPA for policy decisions of material controls. Control of expansion aids may go to RFC. Complete merger of all mobilization agencies isn't likely at this time, but in paring down the powers of DPA, there is the chance that Mobilizer Wilson is paving the way for the merger of DPA with NPA.

TRANSIT RADIO IS UNCONSTITUTIONAL, the U.S. Court of Appeals for the District of Columbia ruled early in June. In a unanimous decision on commercial broadcasts in Capital Transit Co. vehicles the court said, "Transit's broadcasts deprive objecting passengers of liberty without due process of law." But the broadcasts continue, pending appeal to the U.S. Supreme Court. While the decision affected only the situation in Washington, there seemed little doubt that its impact would be nationwide. The commercial time-selling agency with which Capital dealt--Transit Radio, Inc., of Cincinnati--also has transportation broadcasting franchises in Cincinnati, Des Moines, Huntington, W. Va., Jacksonville, Kansas City, Mo., Omaha, Pittsburgh, St. Louis, Tacoma, Trenton and Worcester.

A CUT IN METALS for automobile production--to take effect July 1--will limit third quarter production to about 1.2 million units. The announcement early this month from Courtney Johnson, director of the NPA's Motor Vehicle Division, means that 37 per cent fewer cars will be manufactured during the next three months than during the industry's big third quarter of 1950, just about 5.4 million this year, compared to 6.5 million in 1950. A new formula was used in the recent order, allocating steel, copper and aluminum to manufacturers on a percentage basis.

JOHN L. WILSON HAS RESIGNED, effective on the first of next month, from the presidency of the St. Louis Public Service Co. He will con-

Copyright 1951, McGraw-Hill Publ. Co., New York 18, N. Y.

tinue to serve on the board of directors of the company. In seven years of Wilson's administration St. Louis has completely modernized its transportation system. Its shops and offices have been remodeled extensively, and since 1944, 825 buses and 100 new streamlined trolley cars have been purchased at a total cost of more than $15 million. On May 15 the company retired all its bonded indebtedness. Wilson moves over to an officer's post with the Anheuser-Busch Co.

THE ST. LOUIS COMPANY has announced the election of John C. Baine as executive vice president and chief operating officer, and of Gaylord C. Burke as vice president and general counsel. Baine, with the company since 1947, previously was in charge of transit operations of the New Orleans Public Service Inc. Burke, general counsel since 1948, joined the company five years ago.

THE OWNERSHIP OF ACF-BRILL WILL CHANGE HANDS SOON. An agreement to purchase the AVCO Manufacturing Co. interests in ACF-Brill Motors Co. has been made by Allen and Co., New York City. The deal involves the 48.4 per cent of common stock in ACF which is held now by AVCO. Final plans to consummate the transaction will be made sometime this month.

A SCORE OF ATA SAFETY AWARDS covering 1950 were presented during the recent ATA conferences in Baltimore. Five silver plaques, symbolic of the top awards, and 15 special citation certificates were handed officials of the winning companies by DTA Boss James K. Knudson. An additional award, in the form of a gold certificate, went to Dixie Traction Co., Covington, Ky., for racking up more than 1,000,000 consecutive man-hours without a lost-time accident. Full coverage of the ATA conferences will be found on page 80.

GREYHOUND TRAFFIC RAN AHEAD of the first four months of 1950 during the like period this year, President Orville S. Caesar told a recent stockholders' meeting. It was the first time since 1948 that such encouraging figures have been reported. Earnings after all charges for the first quarter of 1951 approximated $1 million, equal to nine cents per common share. In the March quarter last year net earnings were equal to four cents a share.

THE BETTER SHOWING WAS REFLECTED when the board of directors of the Greyhound Corp. voted to pay a quarterly dividend of 25 cents a share on the common, plus the regular quarterly dividend of $1.06¼ on the 4¼ cumulative preferred.

AN OFFER TO BUY MONTREAL TRAMWAYS for $4.2 million has come from the Montreal Transportation Commission, which proposes to pay $60 for each of the 70,000 outstanding shares in the system. The city plans to operate it as a publicly-owned system.

A CITY-WIDE TRANSIT STRIKE in New York has been threatened by Mike Quill's Transport Workers Union, CIO, unless the Board of Estimate comes through with a 40-hour week for 42,000 employees of the city-owned services, plus a 10 per cent wage rise. Enraged by a report from two engineering firms recommending elimination of jobs,

reduction in weekly pay and sharp service cuts, Quill has set July 1 as the strike date and will have the men ask for vacations starting July 2. Thousands of workers demonstrated outside City Hall but the Board of Transportation had agreed not to penalize demonstrators so the Condon-Wadlin Act--forbidding strikes by public employees--would not become an issue.

IN RESTRAINED FASHION FOR HIM, Quill said union leaders "would do everything in their power to settle this," and urged that Mayor Impellitteri enter the negotiations. So far the mayor has criticized both the union and the board for fumbling negotiations, but has accomplished little more. Granting the full union package would cost the city at least $54 million the first year. On this Quill said: "It's a tax problem. Let them (the mayor and the board) find the money as well as they can."

A $1.6 MILLION LOAN TO BUY VEHICLES has been negotiated by Indianapolis Railways, Inc. Five Indianapolis banks put up the money with which the firm plans to buy 62 new 45-passenger diesel-powered buses and with which it has already purchased 28 trolley buses from Louisville. Another 25 trolley buses are on order from Marmon-Herrington. The new vehicles will help the transit company put into effect sooner than originally planned the extensive re-routing program required by Indianapolis' one-way ordinances.

"TRANSPORTATION SHOULDN'T KNOCK THE COMPETITION," was in effect what DTA head Knudson said in an address recently. Acrimonious advertising warfare between transport industries can be very harmful at this time, he said, because it stands squarely in the way of the effective cooperation of all forms of transport. "Recrimination, charges and counter-charges" make up the bulk of transport advertising, he pointed out, but "we of the DTA would welcome a moratorium on this type of public expression until the nation has attained the expansion in transport capacity which is essential to its safety, come what may."

THE ATA WAR PROGRAM COMMITTEE met in Washington on June 3-4 to discuss preliminary phases of the program for 1952 with respect to equipment and materials, manpower and civil defense. Harley Swift, chairman of the committee, conducted the sessions. Interested members of the operating and manufacturing side of the industry were in attendance, as well as a number of officials from DTA and NPA.

REORGANIZATION IS IN STORE for New York State's Public Utilities Commission. Reason: to expedite procedure and to enable the agency to work with an increased load. The changes mark the first major redrafting of its set-up since the commission was founded 30 years ago. Avoiding the duplication of effort which has evolved haphazardly since the commission's 1921 beginnings, said Chairman Benjamin F. Feinberg, the new plan means that the 12 principal investigating units of the commission will be coordinated under two separate divisions responsible to the commissioners. In addition, four staff bureaus--administration, counsel, hearing and research--will report directly to the commissioners.

Get More Miles

"Despite the fact that overall expenses were reduced and many economies instituted, the net income for the year has declined drastically."

THE ABOVE quotation is from the 1950 annual report of a progressive, well-managed transportation company. This is by no means the isolated complaint of a single company; similar statements appear in the annual reports of other transportation companies—most of them, in fact. And they point to the urgent need for early action.

To combat this situation, two courses are open. One is to get more riders, the other to get more mileage from the vehicle and its components. Both are of first magnitude importance. In this issue, the 26th Annual Maintenance Number, the sights are set on the objective of getting more miles from fuel, from tires and from the various vehicle parts which are subjected to wear and tear.

Mileage gained from operating supplies—fuel, oil, tires—or from operating units—engines, transmissions, axles—not only means lower cost per mile for the supplies and materials themselves, but what is becoming increasingly important, lower cost per mile for the labor of handling or reconditioning them.

Several avenues are open through which greater mileage and greater maintenance economies can be gained. Briefly stated, here are four of them:

1. Thorough analysis of the maintenance system in current use with an eye to the elimination of inefficient practices and resulting poor workmanship.

2. Replacement of obsolete or worn out testing apparatus and shop equipment with modern appliances.

3. Inauguration of a training program for less-skilled members of the shop force and a refresher course for the older mechanics.

4. A thorough reading of this issue of BUS TRANSPORTATION. *It will be profitable reading.* Its pages are packed with worthwhile ideas and suggestions which will tell how different companies are reducing costs by upping mileage.

THE EDITORS

Testing injectors in spotless, glass-enclosed room pays off in terms of . . .

BUS TRANSPORTATION Maintenance Mobilization Issue 1951

More Miles Per Gallon . . . In Diesel Operation

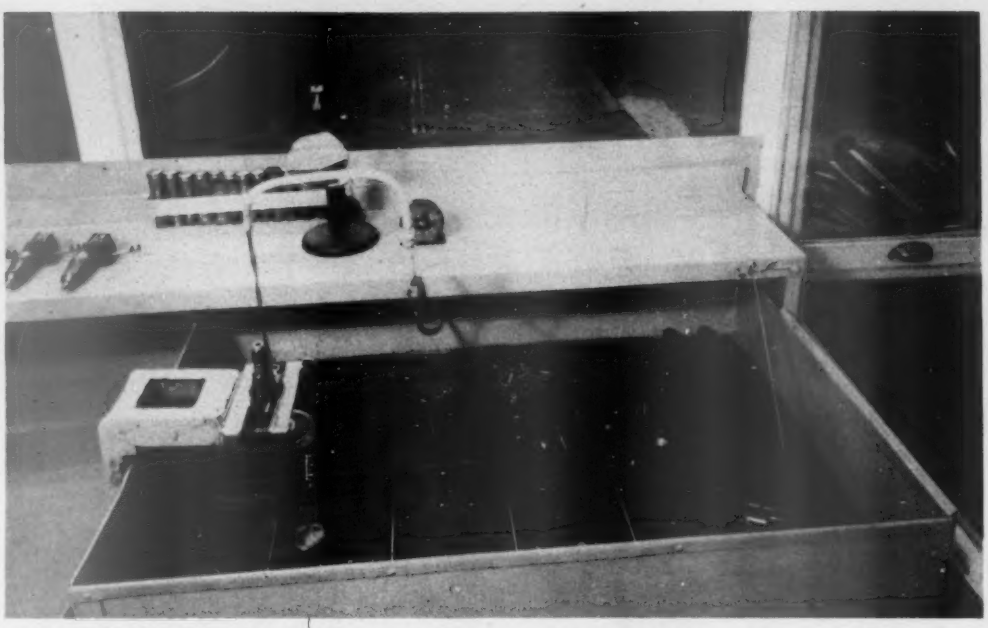
Louisville Railway completes a successful drive for the elimination of smoke and fumes and finds it has also racked up some gratifying gains in fuel mileage.

By Torrens A. Smith
Superintendent of Equipment
The Louisville Railway Co.

● A SUCCESSFUL CAMPAIGN to reduce diesel smoke and fumes resulted in a worthwhile dividend in the form of a substantial increase in fuel mileage for the Louisville Railway Co. Prior to this campaign, the fleet average for diesel fuel was 4.13 mpg in winter and 4.47 mpg in summer. Following the campaign, fuel mileage for the same buses for corresponding periods in 1950 was 4.92 mpg and 5.37 mpg. This represents a cold-weather gain of 0.79 mpg, and a warm-weather gain of 0.9 mpg.

The problem of fume abatement was approached from three angles: first, to assure that proper compression pressures are maintained; second, to see that injectors are overhauled properly and tested accurately; and third, to time injectors properly after installation.

The first item posed no particular problem other than to see that rings,



TEARDOWN AND OVERHAUL TANK gives injectors a constant bath as they are dismantled and reassembled. Filled to about half its depth with diesel fuel, the metal tank has a wire mesh screen with 12 compartments to hold various parts.

Clean surroundings are as important to the job

sleeves, pistons, etc., were in proper mechanical condition. Being assured of this the next step was to assure proper overhauling and testing of the injectors.

Of importance equal to proper tools is the surroundings in which they are used. A high order of cleanliness is paramount. The room in which injectors are overhauled is glass enclosed and pressurized with filtered air. This in order to prevent dust or other foreign matter coming in contact with the units while work is in progress. To further guarantee this, injectors are subjected to a continuous oil bath while being dismantled for repair and being reassembled afterward.

As shown in a photo a metal tank has been built for the purpose. This is filled to about half its depth with diesel fuel. Supported in this tank is a wire mesh screen containing 12 compartments to hold various parts.

Below the tank is a standard GM diesel fuel pump driven by a quarter horsepower motor. This pumps fluid from the tank through a filter and thence to an adjustable gooseneck outlet. The injector being overhauled is held in a clamp and the gooseneck adjusted so that it is flooded with fuel while being worked upon. This prevents any dust which might be in the air from getting on the injector, and it also eliminates rust formation from moisture on the workman's hands.

Overhaul completed, the injector is placed in a Curtiss & Smith test fixture which has been modified in order to develop the 1,400 lb. pressure which in our opinion is necessary properly to test an injector.

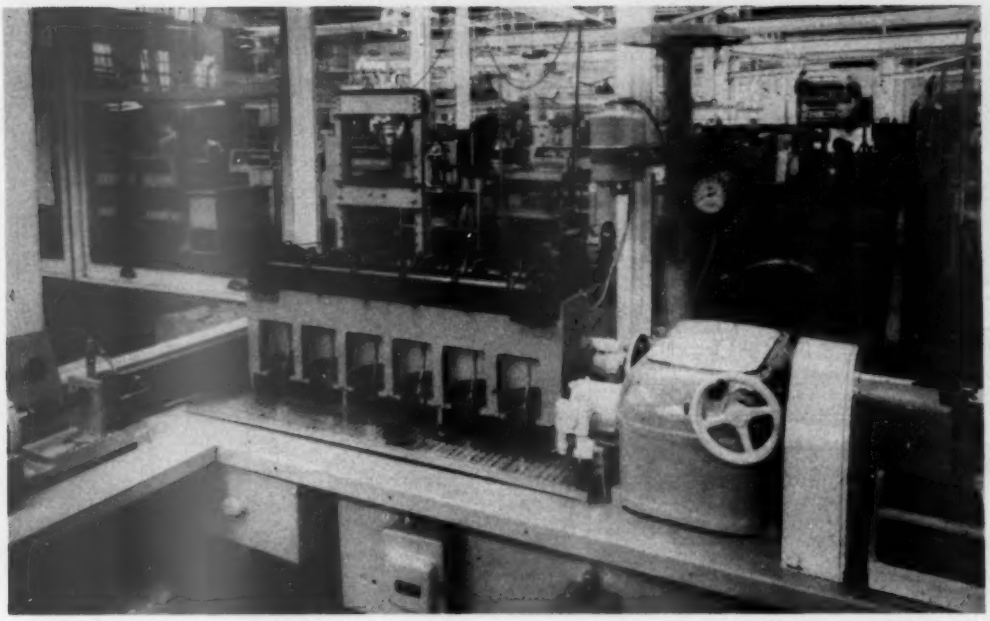
Shopmade Fixture Checks Jets

After being "popped" and the spray pattern checked with this tester, the injectors—in sets of six—are installed in a shop-made "balancing" fixture which is shown in another photo. This device is made from the upper part of a diesel cylinder block and a portion of a diesel cylinder head and is operated by a 1½ hp motor through a variable speed drive.

With this device the injectors are tested for one minute at 1,000 rpm. The fuel dispensed by each injector is collected in a glass beaker and the amount collected is carefully noted. Injectors then are assembled in "balanced" sets of six each, with no jet in the set varying more than five cubic millimeters plus or minus.

The injectors used in Louisville buses are nominally rated at 60 cubic millimeters. It has been found, however, that even brand new units will vary anywhere from less than 60 to over 70 millimeters. Attempts to correct this by changing various parts have failed to change the output unless the plunger and bushing also were changed. Since these plungers and bushings are relatively costly, it seemed rather foolish to scrap them merely because the actual output varied from the rated output. Moreover, it was believed that the amount of fuel passed by the injector was immaterial so long as the other units in the engine passed the same amount of fuel at the same time.

As the test of a pudding is in the eating, so is the test of a recondi-



SHOPMADE "BALANCING" FIXTURE checks output of six injectors at once. Fuel flow of each is taken in a beaker, and the amount collected noted carefully. Injectors are then assembled in "balanced" sets of six, with almost no variation between them.

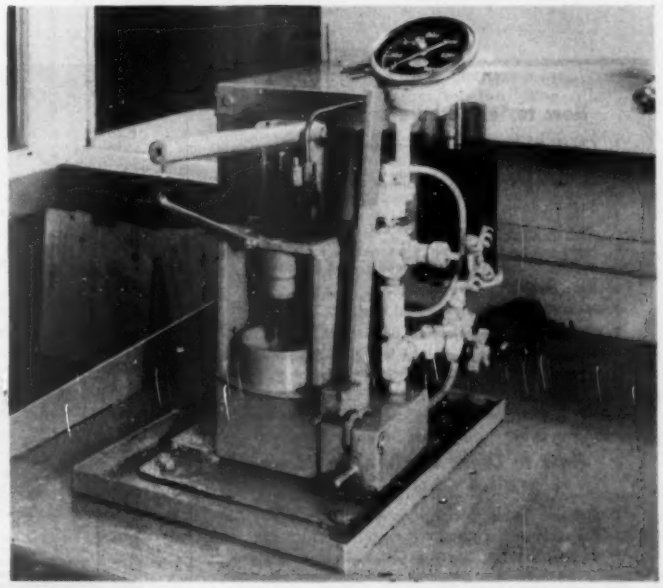
as proper tools

tioned injector in its ultimate performance. How the unit behaves in actual service is the test in this instance. After the injectors are installed in the engine, the next step is to assure proper timing.

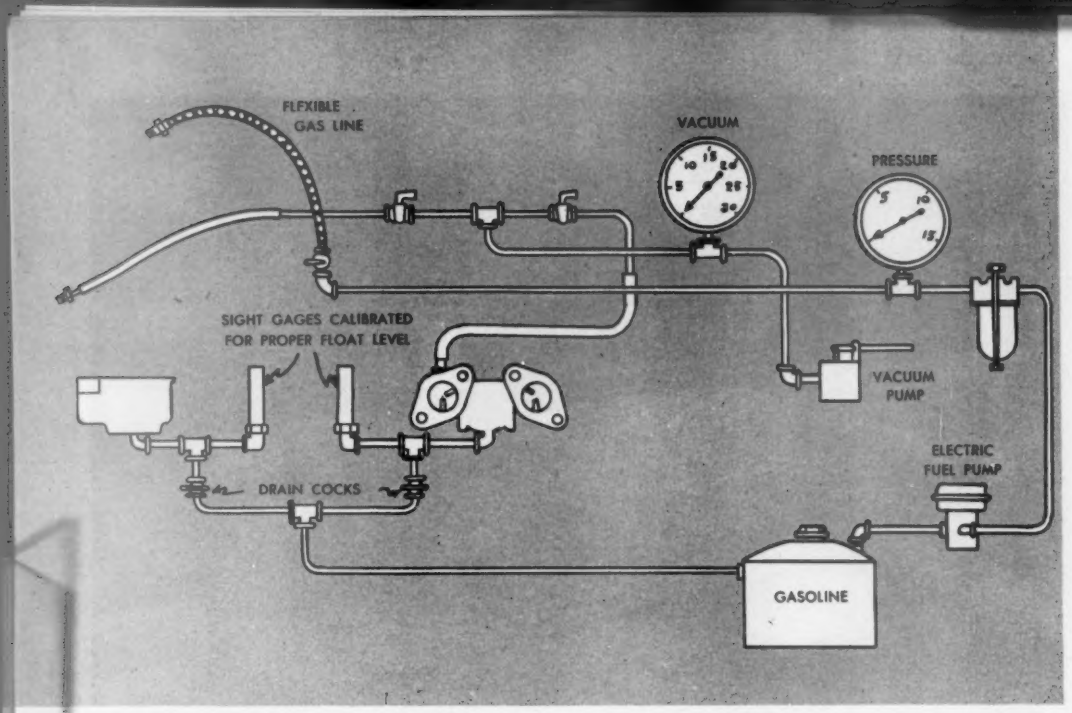
Fuel Mileage Ups Steadily

Experience proved that the adjustment method outlined in the instruction manual did not produce sufficiently accurate results so a fixture was developed for the purpose. This incorporates a dial indicator which is held against the idle adjusting screw on the governor. With this instrument accurate adjustment of each individual rack can be made to within a thousandth of an inch. The indicator also will reveal any binding or misadjustment in the governor itself.

Not only has this program been gratifying both from the standpoint of eliminating smoke and fumes, but even more so, is the month to month increases in fuel mileage as balanced assemblies go into more and more engines.



POP TESTER has been modified so it will develop the 1,400 lb. pressure needed to test an injector properly. The injector is "popped" and the spray pattern checked on this Curtiss & Smith fixture. Glass enclosure makes for scrupulous cleanliness, most important to the testing operation.



INEXPENSIVE TEST STAND for setting carburetor float levels and checking accelerating pumps. Built by Capital Transit Co., with the help of Ethyl Corp., the device is simple but accurate. Procedure to follow in using the stand is stated in the box below.

More Miles Per Gallon . . .

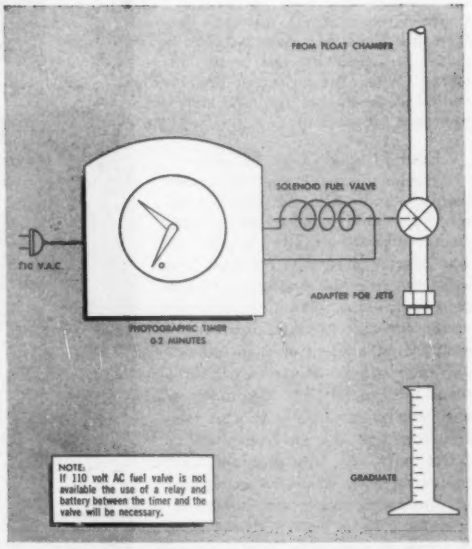
How to Set Carburetor Float Levels

1. Check float level with template to get approximate setting.
2. Mount top on dummy carburetor, connect gas line.
3. Shut off drain.
4. Turn on gas until needle valve cuts off flow of gas.
5. Note pressure build up when needle valve is closed. Use gauge to check for needle valve leakage.
6. Read meniscus on sight gauge.
7. If meniscus is high, lower float level.
8. If meniscus is low, raise float level.
9. This method is a good check for action of needle valve and seat. Also checks template method of setting float.

How to Check Accelerating Pumps

(With head on and carburetor full)

1. Connect vacuum line.
2. Operate vacuum pump.
3. As vacuum is released, note action of accelerator pump by evidence of gas discharged into venturi chamber.
4. Make certain there is slight discharge at 6" — 7" vacuum indicating that accelerator pump has allowed economizer jet to close.


FROM FLOAT CHAMBER
SOLENOID FUEL VALVE
110 V.A.C.
ADAPTER FOR JETS
PHOTOGRAPHIC TIMER 0-2 MINUTES
NOTE: If 110 volt AC fuel valve is not available the use of a relay and battery between the timer and the valve will be necessary.
GRADUATE

FLOW TESTING JETS under constant head of pressure. Head is gained by piping fuel from one of carburetor bowls with a top and float in place. Electric timer completes device.

BUS TRANSPORTATION Maintenance Mobili tion Issue 1951

GETTING THAT EXTRA HALF-MILE per gallon depends on a great many factors. One of the most important is proper training of all personnel concerned with bus maintenance.

. . . How to Save Gasoline

By A. E. Savage • *Equipment Engineer*
Capital Transit Co., Washington, D. C.

● GASOLINE ECONOMY is influenced by many things, ranging from the pressure in the bus tires to the pressure on the bus driver. Its importance is well known by the fleet maintenance man who must constantly watch his costs, since in large bus operations, squeezing out half-a-mile per gallon increase can well mean an annual savings running into six figures.

Generally speaking, the approaches to gasoline economy which can furnish the most substantial results concern carburetor adjustment, carburetor maintenance, and special attention to items other than the fuel system itself. A wealth of material could be incorporated in this article on all three phases, but much of it would be a repetition of well known facts.

It is the feeling of the author, therefore, that a description of a relatively inexpensive flow meter and carburetor float level, needle valve, and accelerating pump test stand will have more to offer, so emphasis has been placed on the second phase. The brief coverage of the other two, however, is not meant to minimize their importance.

Idling Adjustment Big Economy Factor

Carburetor adjustment on most buses is limited to the idle circuit. Tests of city operations have proven this adjustment is extremely important from the standpoint of fuel economy and exhaust odors, since not only is the accelerator in the idling position a large percentage of the time of operation, but the idling adjustment also affects the mixture obtained in the other circuits. Whether adjustment is made with a vacuum gage or an exhaust gas analyzer (and tachometer in either case), the coach should be level and thoroughly warmed up, and care taken to insure that a proper adjustment can be actually made. Restricted air bleeds or worn jets may prevent the obtaining of a sufficiently lean adjustment, or the carburetor may be jetted in such a way even when new as to make an air-fuel ratio approaching 13 to 1 impossible to obtain.

Simple and Accurate Devices

Unfortunately most buses operate reasonably well with an uneconomically rich mixture so that faulty adjustment may go unnoticed. An examination of the tail pipe deposits gives a good indication of maladjustment. These deposits should be light tan or light grey in color; a black color means that the idle mixture is too rich.

Maintenance and overhaul of carburetors, whether done on a periodic or on a condition basis, must be of a caliber to obtain the confidence of the mechanics who make the adjustment. Such confidence will reduce the tendency for mechanics arbitrarily to change carburetors to overcome an engine condition which is in reality due to some other cause.

A positive means of accurately setting float levels, adjusting accelerating pumps, and flow testing jets becomes an invaluable aid not only to insure accurately

calibrated carburetors after maintenance or overhaul, but also as a means of determining whether a prematurely shopped carburetor is actually at fault.

This undoubtedly brings visions to the mind of the reader of expensive apparatus and a highly technical man devoting his time to flowing jets, etc., but this need not be the case.

Simple and accurate devices can be readily assembled to any shop at a reasonable cost. Top of page 42 shows a test stand for setting float levels and accelerating pumps which was built by the Capital Transit Company with the help of the Ethyl Corporation and which received some publicity about a year ago. As can be seen, the float level and needle valve are tested under fuel pump pressure. No unusual parts are involved. The dummy carburetors would be of the types used on the property building the device. Two typical types are shown for illustration.

Separates Good Jets from Bad

To this stand may be added, as shown bottom page 42, a means of flow testing jets under a constant head of pressure. By merely piping the fuel from one of the dummy carburetor bowls with a top and float in place, the constant head is obtained. An electric timer of the type available in photographic supply stores with a range of from 0 to about 2 minutes provides an automatic, accurate, and relatively inexpensive way of controlling the flow time through an electrically operated fuel valve. Should a 110 volt valve be available, the valve can be operated directly from the timer; however, if only a 6 to 12 volt valve is available, a simple relay will be necessary.

This leaves only a set of home-made adaptors to be made (to accommodate the jets to be tested) and the purchase of several graduates to complete the flow meter.

A wide latitude is possible in setting up the flow meter, since it will be necessary for the shop to set its own flow standards. The rated flow for jets has not been normally available from the manufacturer. The head, the time of flow, and the tolerances to be allowed must therefore be established by the user.

Once set up, jets of a type may be most expeditiously checked in batches to save time in fitting adaptors to the outlet. No technical skills other than those normally required of a carburetor maintenance mechanic are required, and experience has shown that although the flow meter may be regarded with suspicion by a carburetor mechanic beforehand, he rapidly becomes sold on a device by means of which he can definitely separate good jets from bad.

Ignition systems, their maintenance and adjustment, of course, also have an important part in obtaining as many miles as possible from a gallon of gasoline. Many fleets have found it to their advantage to have at least one man in each operating garage specially trained in tune-up procedure and carburetor and ignition diagnosis.

It should not be forgotten that the most careful adjustment of assembled units such as carburetors and distributors can be nullified by rough handling in transit between the shop and the using garage. Close fitting wooden boxes for such units have been found to reduce this hazard to a reasonable minimum, and by virtue of their use seem to promote a state of mind among the personnel involved which results in more careful handling.

In fact, a general campaign among the foremen and mechanics toward "carburetor consciousness" and encouraging a competitive spirit among garages by publishing gasoline mileage figures will, in themselves, effectively encourage fuel economy.

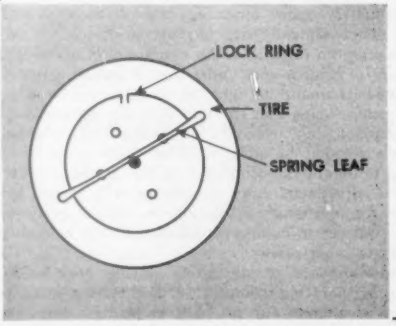
Driving Technique Affects Problem

Naturally, further possible savings in gasoline in any fleet depends on the point from which further effort is made. Overall results may not be immediate, but constant attention and active campaigning on the part of maintenance supervisors are among the ingredients which constitute the prescription for satisfying results.

Finally, mention should be made of the great influence that driving technique has on gasoline economy. On a bus that normally averages 3 miles per gallon, informal tests have proven that "overdriving" as compared to careful acceleration by a fuel-conscious operator (properly trained) can vary the gasoline mileage about a mile per gallon.

Such a variation shows that the most careful mechanical precautions can be more than overcome by improper operation. Training and follow-up by instructing personnel of the operating departments in close cooperation with a maintenance advisor obviously holds additional possibilities for extending fuel economy.

Tire Locking Device Helps Reduce Accidents



IF THE LOCK RING SLIPS during tire inflation, a serious accident can result. After a near accident from such a cause, Suburban Transit Lines, Macon, Ga., devised a procedure which is now a must when tires are being inflated. In fact, it is a part of the company's accident prevention program.

IT WORKS THIS WAY: a heavy-duty spring leaf is inserted in the holes in the steel wheel so that the ends of the leaf extend over the lock and tire, thus holding both in place. The operation is simple enough and requires only a moment to complete. But it removed a serious hazard in tire inflation.

TIRE REGROOVING TOOL is power driven, has two cutter heads for simultaneous cutting of dual rear tires. Power machine does job on four wheels (dual rears) in 20 minutes as against three hours with the old, clumsy, hand-operated regrooving machine.

More Miles Per Tire

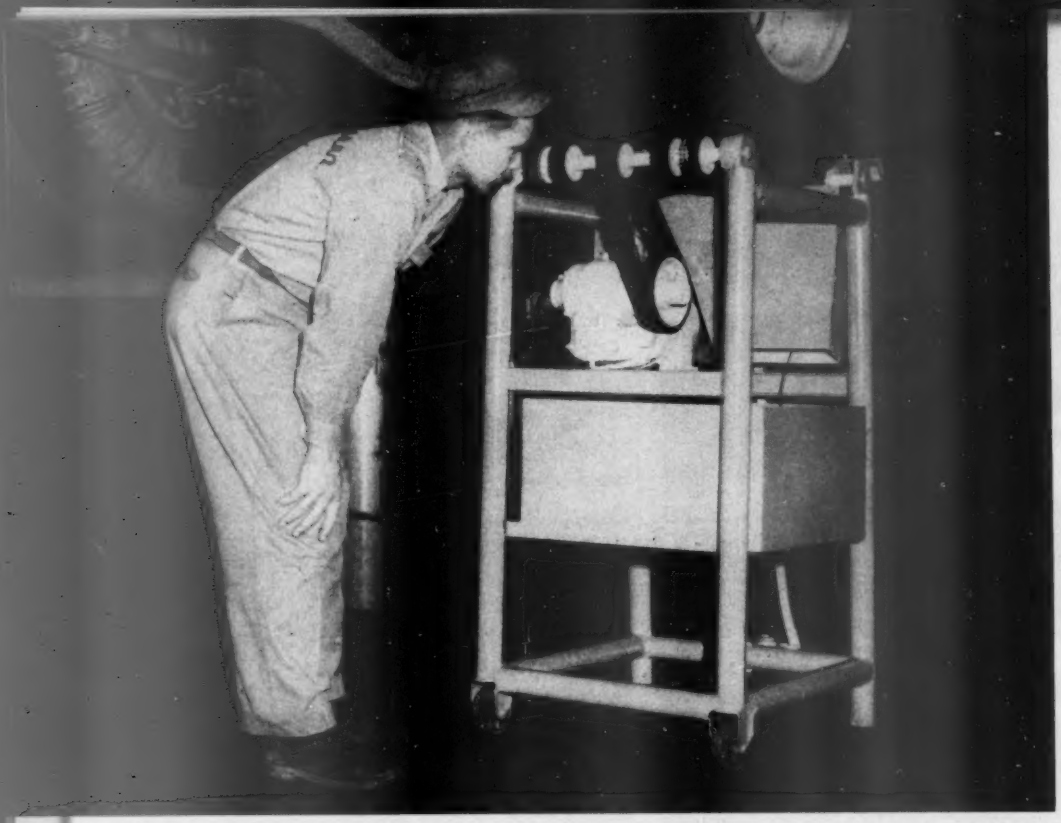
Here are two ideas in the interest of rubber conservation which promote better performance and longer tire life.

BUS TRANSPORTATION Maintenance Mobilization Issue 1951

1. Southern Penna Regroover

● A BETTER tire-regrooving job at a direct saving of 2⅔ man-hours per bus is credited to the power driven tire regrooving machine developed in the Chester, Pa. garage of the Southern Pennsylvania Bus Co. by Ray Parsons and Bill Blake.

Prior to development of this ma-



REAR VIEW of regroover shows cog-like rollers which rotate at ultra-slow pace (three to four tire rpms). Easy to rig up, rollers are discarded timing gear sprockets, motor's chain-drive and gear are a timing gear and chain from a Hall-Scott engine.

chine, bus wheels had to be removed one at a time and trundled across the garage to the tire room where they were slowly and laboriously regrooved by a hand-operated machine. It took about three hours to do four wheels (dual rears) which means six tires.

Twenty minutes is the average time now required with the power machine and the work can be done on a lift or from a pit and without removing the wheels from the vehicle. Production is thus multiplied approximately nine-fold. Added safety is another by-product since workmen need not wrestle with heavy wheel assemblies.

Materials Easily Found

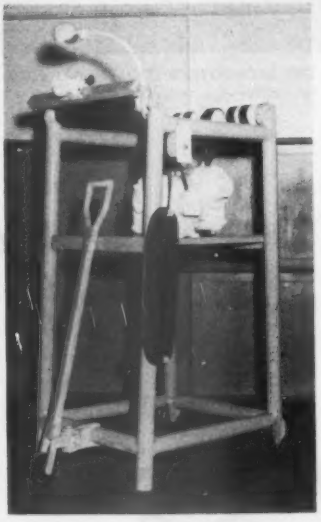
The regroover was made up from materials readily available around most bus shops, as is evident from the photos. Ordinary tubing and sheet metal form the stand on which the regrooving cutters and drive mechanism is mounted. The cog-like rollers which rotate the tires are discarded timing gear sprockets and the chain-drive and gear on the motor is a timing gear and chain from a Hall-Scott engine.

The motor itself is a "war surplus" integral gear reduction drive type with an 80 to 1 reduction to provide ultra-slow speed (3 to 4 tire rpm) so that careful inspection is possible while the grooves are being "machined" or cut.

The cutter head originally came with a manually-operated regroover and is similar to a lathe tool post in operation and construction. The cutting tool itself is a hollow loop affair and the depth of groove is controlled by a hand wheel.

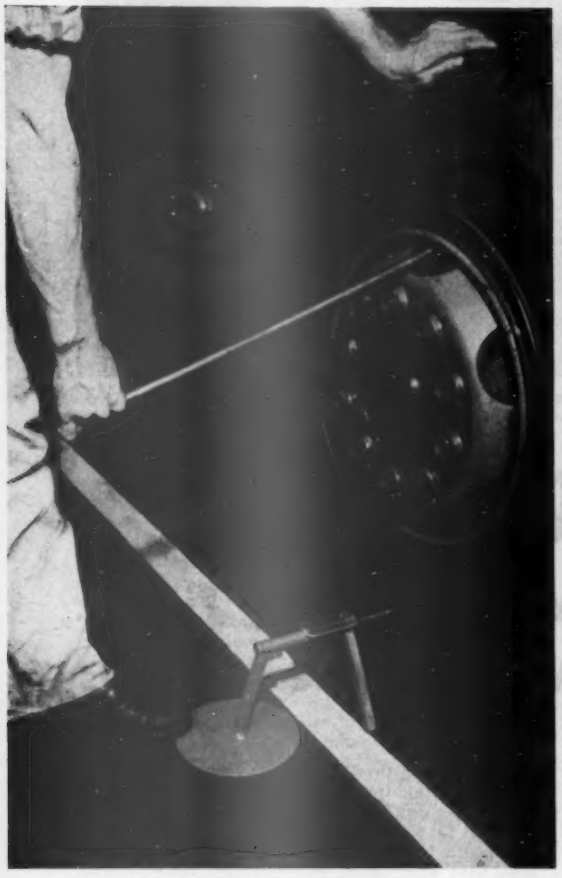
It will be noted in one of the photos that the machine is equipped with two cutter heads so that both tires on dual rear wheels can be regrooved simultaneously. Rubber trimmings from the operation are fed into a trough and dropped into a square metal container.

The unit is mounted on three casters for portability; the forward caster is offset so that the machine can be anchored firmly.



SIDE VIEW shows cutter head, resembling lathe tool post. Three casters provide portability, with one offset for firm anchorage.

Rubber is vital to National Defense and Public Transportation. Conserve it by getting more miles out of your tires.



SPINDLE WEAR INDICATOR measures amount of lateral movement in king pin, need for spindle rebushing job.

ANOTHER TIRE SAVER checks run-out due to uneven wear, which can give front wheel shimmy. Dial-type gauge gives reading.

2. Tire Savers From St. Louis

● St. Louis Public Service Co. employs the shop-made tools shown here to guard against premature tire wear. A small amount of misalignment of front tires can result in excesive wear, premature failure and possible accident. With the two devices shown here, however, such possibility is minimized.

One of the photos shows a stand which has been designed by St. Louis shopmen to check tire run-out due to uneven wear which might cause shimmy on a front wheel. The tire under test runs against a small roller which is mounted on a spring-loaded plunger with a dial type indicator gage which reads in small fractions plus or minus zero. This instrument is used in the central tire room.

The other tire saver is a spindle wear indicator. It is used to measure the amount of lateral movement in the king pin. This device also has a spring-loaded plunger which moves an indicator which is calibrated in eighths of an inch.

In measuring accurately the amount of wear present in the king pin all guess work and human error is eliminated in designating when buses shall be shopped for a spindle rebushing job. All outlying garages are supplied with this device thus guaranteeing a uniform standard when reporting king pin bushing condition.

WHEEL BALANCING at B & W (Boston & Worcester) Lines, Framington, Mass. This service has contributed considerably to greater tire mileage and reduced maintenance costs.

BUS TRANSPORTATION Maintenance Mobilization Issue 1951

Still More Miles Per Tire . . . With Balanced Wheels

By G. Heiber

Vice-president Maintenance of Equipment
Boston, Worcester & New York St. Ry. Co.
Framingham, Mass.

● WHAT ARE THE advantages, if any, of balancing wheels on buses? That is a question frequently asked by bus maintenance men. Our experience, after more than three years trial, is that wheel balancing is definitely beneficial on an operation such as ours and which can be classified as short-haul intercity service.

Here, briefly, are the facts which support our claim. In the latter part of 1947 we purchased a Stewart-Warner Wheel Balancer and immediately embarked on a campaign to correct out-of-balance conditions in the front ends of our buses. Results were also immediately forthcoming and the average tire mileage for the fleet in 1948 was 69,399 miles per tire.

In 1949 the fleet average rose to 83,374 miles per tire, an increase of 20 per cent. In 1950 the fleet average increased to 87,535 miles per tire, or about 25 per cent greater than in 1947. In our opinion, there is no question but that the tire balancer was greatly instrumental in helping achieve this increase.

Since the balancing campaign started we know that mileage on front tires has increased by 30 per cent before the non-skid tread wears smooth. On older vehicles, about 75 per cent of former shimmy troubles have been corrected by balancing the front wheels. The balancer also detects bent wheels and wheels in which the stud holes have worn oblong and thus need reconditioning.

Foregoing are the results as revealed by our records. To those interested in a further exploration of the subject, the following paragraphs will attempt to explain the theory behind wheel balancing.

Two Important Reasons

Because all wheel and tire assemblies need balancing, wheel balancing is important to us for two reasons:

1—It will reduce front end maintenance costs and tire wear. And that is why several coach manufacturers are balancing front wheels on their equipment before it is delivered.

2—It will increase driving safety and comfort. Following this procedure, you will find defective wheel bearings which otherwise might not be detected.

Wheel balancing accomplishes these two important benefits simply by eliminating dangerous and costly vibrations in the running gear caused by unequal weight distribution in the tire, tube, wheel and brake drum.

EFFECT OF UNBALANCE IN A 9.00 x 20 TIRE & WHEEL ASSEMBLY

		AMOUNT OF UNBALANCE						
MPH	RPM	8 oz.	12 oz.	16 oz.	20 oz.	24 oz.	28 oz.	32 oz.
30	261	10 lb.	15 lb.	19 lb.	24 lb.	29 lb.	34 lb.	39 lb.
40	350	18 lb.	26 lb.	35 lb.	44 lb.	53 lb.	62 lb.	70 lb.
50	435	27 lb.	41 lb.	54 lb.	68 lb.	81 lb.	95 lb.	108 lb.
60	523	39 lb.	59 lb.	78 lb.	98 lb.	117 lb.	136 lb.	156 lb.
70	610	53 lb.	79 lb.	105 lb.	132 lb.	158 lb.	184 lb.	210 lb.

For example, consider a 9.00 x 20 tire and let us assume that the entire wheel and tire assembly is only 12 ounces out of balance. (This is a very conservative amount, as often a wheel assembly of this size may be out 30 ounces and more). When this wheel and tire is installed on a bus and the vehicle driven at just 30 miles an hour, centrifugal force increases the effect of this small 12 ounce unbalance to 15 lbs. and this 15 lb. blow strikes the tire at each revolution of the wheel (261 times a minute).

But that is 30 miles an hour. Most intercity vehicles travel at greater speeds. At 60 miles an hour, for example, the same wheel assembly with the same amount of unbalance is subjected to a pounding force of 59 lbs. 523 times per minute.

It is easy to visualize the damage that this continuous pounding does to the tire and running gear. It is like a trip-hammer, pounding away, mile after mile and hours on end. First the tire hits the pavement with crushing force, scuffing off expensive rubber—paving the road with your pennies and nickels. It is vitally important, particularly at this critical period, to prolong the life of your precious tire. Wheel balancing will do this. And as the use of synthetic rubber increases, the actual need for balancing will increase greatly. This applies both to new tires and to recapped tires.

The pounding force created by unbalance also is transmitted to the steering mechanism, pounding king pins, bearings and tie-rod ends, and causing excessive wear. And, finally, the vibrations come through the steering gear and to the driver. This will cause the driver to fight a jiggling steering wheel. He has to concentrate on keeping his vehicle steady and on the road, and this increases driver fatigue. Unbalanced wheel vibrations transmitted to the body of the vehicle from the frame also bring complaints of discomfort by both driver and passengers.

Many vehicles have been reported for repair for this single reason—excessive vibrations. Many steering mechanisms have been torn down and rebuilt and tires changed unnecessarily in unsuccessful attempts to remedy this trouble. That costs money, both for the repair and because the vehicle is dead-lined. It is not to be implied that wheel balancing will completely eliminate front end service. But it is a proven fact that most complaints of vibrations in the running assembly can be traced to unbalance and corrected through proper wheel balancing.

The method which has proven most successful and most economical is to establish wheel balancing as a regular periodic maintenance service. With proper equipment which, incidentally, costs much less than a set of coach tires, balancing can be done right on the vehicle. This is important to us for it means low labor cost. In addition, on-the-vehicle balancing balances the entire running assembly—tire, tube, wheel, bearings and brake drum, in one automatic operation. It balances the wheel assembly as a part of the vehicle at all road speeds, under actual operating conditions.

Balancing Tire and Tube Not Enough

You must bear in mind that balancing a tire and tube alone is not enough, and likewise, to balance a tire, tube and wheel without taking into consideration the brake drum would also be at best a partial job. The entire rotating mass—tire, tube, wheel and brake drum—must be balanced as an assembly and, for greatest economy, should be done on its own running bearings to eliminate the costly job of removal and reinstallation.

Make sure the equipment is capable of doing the job on the big wheels, including dual rear wheels, and that the entire units can be balanced as an assembly. This equipment should also be capable of doing both a kinetic balance (often called static balance), to eliminate pounding up and down vibrations which cause road tramp and bounce, and dynamic balancing, which eliminates side-to-side vibration, which cause "shimmy."

The entire balancing job should be done with a minimum of labor time—not over 15 minutes a wheel—and without requiring the services of more than one man to do the job. These features are necessary if the job is to be done efficiently and economically.

To sum up, a good wheel balancing department will contribute greatly to faster schedules, greater passenger comfort and overall reduction of operating costs. And, too, it is a good feeling to have the driver say:

"I don't know what you did to this bus, but it drives better than a new one," rather than the usual unpleasant but common and entirely justified complaint of hard steering, hard riding and loss of time due to hard-to-handle vehicles.

FIVE SECONDS for a thorough bearing greasing job with this shopmade packer developed by Southern Penna. Bus Co. There are two sizes of grease heads which will take care of front or rear wheel bearings, as desired.

1. Wheel Bearing Inspection at S. P. B.

● In the S.P.B. shop this operation is tied in with brake relining (about 40,000 miles) at which time bearings are removed, cleaned, inspected and repacked. Repacking with the manual type packers on the market is messy and time consuming, while the old-fashioned hand-packing methods, still used by many, is even more so.

With both moderate and high pressure air-operated, portable greasing outfits on the market in 100 lb. size

OLD WAY · A standard bearing packer with moderate capacity reservoir which had to be refilled at fairly frequent intervals—a messy job.

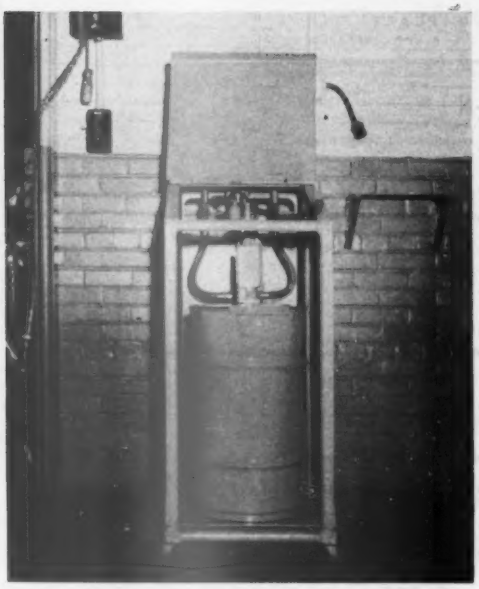
2. The N. O. P. S. Bearing Packer

● A somewhat different but equally efficient idea is employed by New Orleans Public Service as shown here. It embodies an improvement on a bearing packer and was conceived by trolley bus inspector Alvis Guillot.

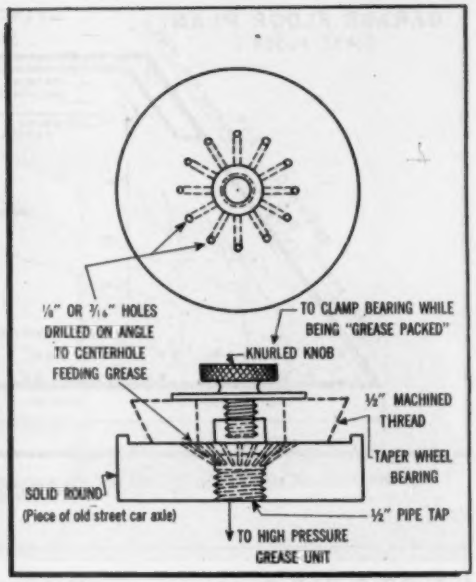
Two photos tell the story. Formerly the packer reservoir had to be refilled as shown at left with lubricant each time its supply was exhausted. Grease in reservoir "B" was forced to bearing "C" by the upward travel of an air-operated piston inside the reservoir. Air was supplied at inlet "A".

Under the new arrangement as shown at right the piston in reservoir "B" is immobilized. The reservoir is given a final filling with grease and the lubricant is forced to bearing "C" by a direct connection "D" from the grease drum.

NEW WAY · With this arrangement the piston in reservoir of packer is immobilized and bearings are packed direct from grease drum in background.



REAR VIEW of bearing packer which employs standard high pressure, air-operated greasing outfit.


⅛" OR 3/16" HOLES DRILLED ON ANGLE TO CENTERHOLE FEEDING GREASE
TO CLAMP BEARING WHILE BEING "GREASE PACKED"
KNURLED KNOB
½" MACHINED THREAD
TAPER WHEEL BEARING
SOLID ROUND (Piece of old street car axle)
½" PIPE TAP
TO HIGH PRESSURE GREASE UNIT

CONSTRUCTION DETAILS of "grease head" which was fashioned from a section of street car axle.

and at reasonable cost, it was decided to revamp such a machine into a bearing packer. S.P.B. shopman John Earl evolved a "greasing head" shown in the sketch and which is the essence of the idea.

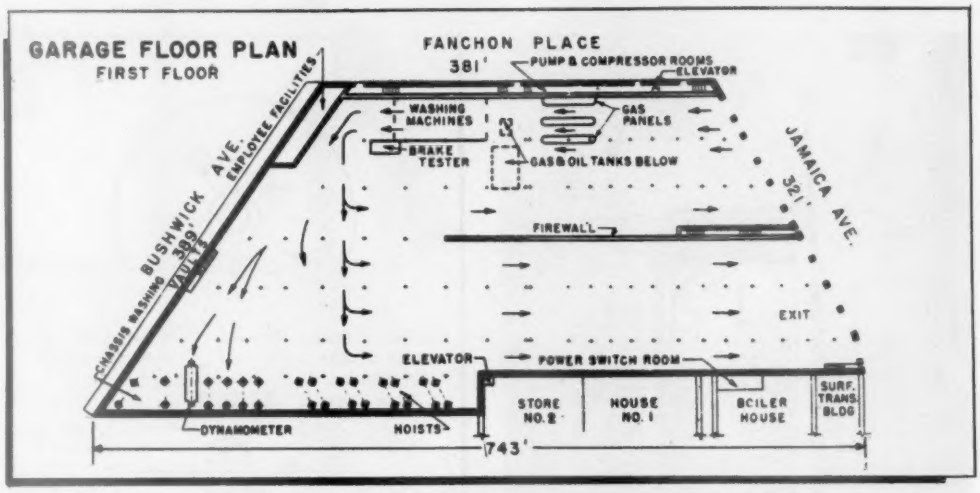
The "head" was machined from a section of street car axle. There is a lead hole in the center and radiating therefrom are a series of ⅛-in. holes through which grease is forced to the bearing rollers. The "head" is connected to the grease gun pressure unit which in turn is connected to a shop air-supply outlet. Two different sizes of heads are provided for front rear bearings. A two-way valve directs grease to unit in use.

More Miles From . . .

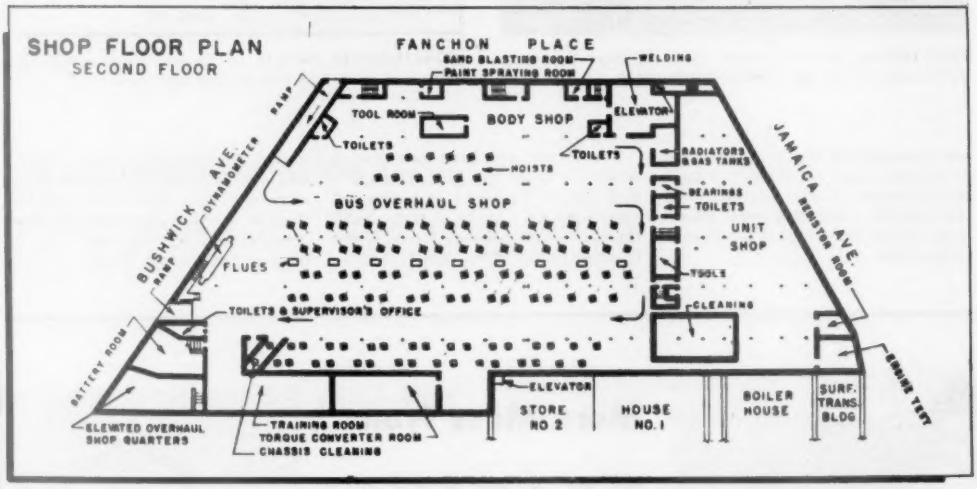
BEARINGS

BUS TRANSPORTATION Maintenance Mobili tion Issue 1951

• WHEREVER ROLLER BEARINGS roll, they will roll with less friction and thus last longer if properly lubricated. Two ways of accomplishing that end are shown here — one from the trolley bus shop of New Orleans Public Service Inc., the other from the bus shop of Southern Penna. Bus Co., Chester, Pa. Both units are portable.



FIRST FLOOR HAS STORAGE AND SERVICE FACILITIES FOR 300 BUSES PLUS AN AMPLE INSPECTION AREA.

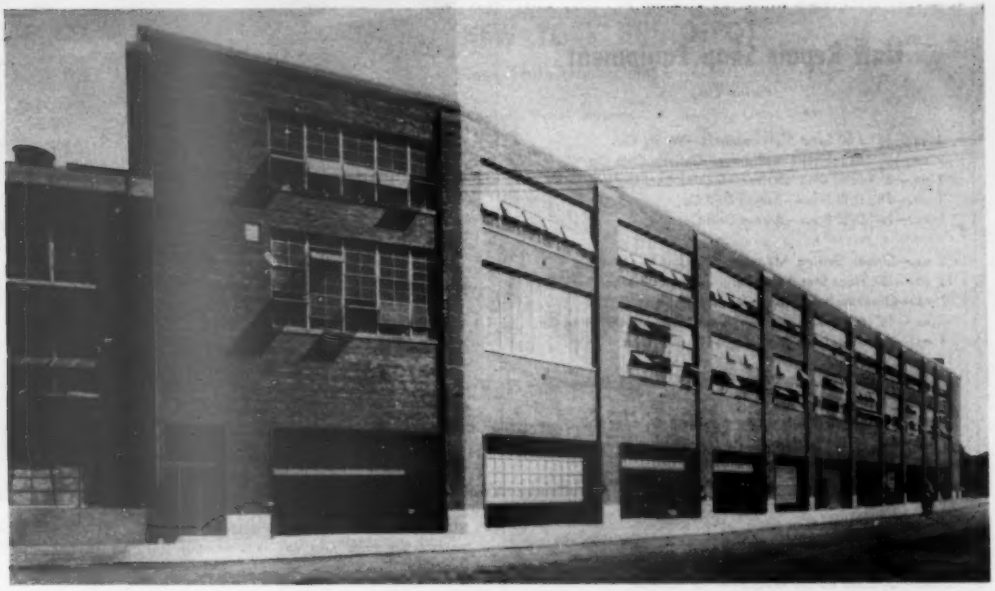


SECOND FLOOR WITH 57 HYDRAULIC HOISTS, HAS OVERHAUL SHOP, BODY SHOP, UNIT REBUILD DEPARTMENT.

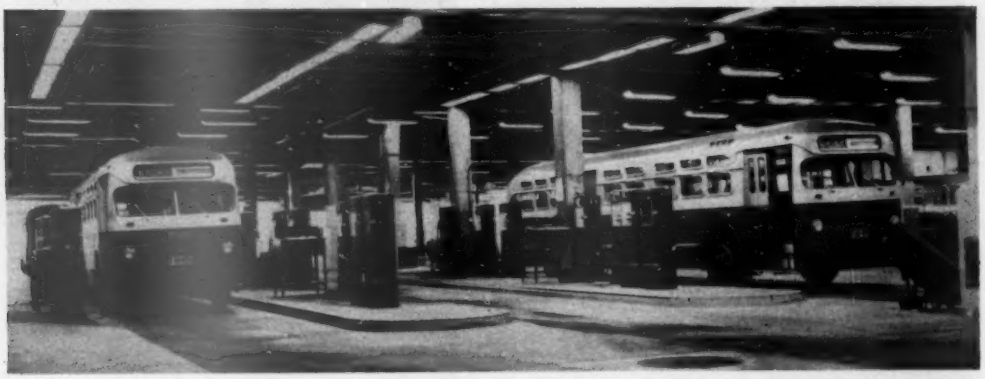
BUS TRANSPORTATION Maintenance Mobilization Issue 1951

$11 Million Bus Shop

The World's biggest bus shop, "East New York Bus Depot" of New York City Transit System. 13 acres of floor space. Production facilities to maintain 3,000 buses. Storage and service for 300.



WORLD'S BIGGEST BUS SHOP is New York City Transit System's huge $11 million setup. Located in the East New York section of Brooklyn, it has a floor space equal to 13 acres, and can maintain a fleet of up to 3,000 buses.



BATTERY OF HIGH SPEED PUMPS, 18 in all, dispense fuel, oil, and water to the 300 buses which are stored and serviced on the garage's first floor, with an area of more than four acres. building has an overall length of 740 ft., is 322 ft. wide.

By Earl F. Theisinger • *Executive Editor*

• UNQUESTIONABLY the biggest and probably the best equipped bus maintenance plant in the world is now being operated by the Board of Transportation's New York City Transit System.

Located in the East New York section of Brooklyn, this new repair center has a floor area of 585,000 square feet—13 acres. Nearly $11 million was spent to construct and equip this new shop and five other associated structures. The latter include a surface transportation building, a boiler house, two storehouses and a paint shop.

The new Brooklyn shop is designed and laid out to handle bus maintenance on a production basis and for a fleet which ultimately is expected to top the 3,000 mark. The City presently operates 2,199 motor buses and 200 trolley buses.

The shop is virtually a manufacturing plant, a fact which is obvious from the $1.35 million worth of machine tools and shop equipment listed in an accompanying table. To heat and ventilate the 11 million cu. ft.

Unit Repair Shop Equipment

(Partial List)

2 ea.—36" x 60 Sand blast cabinets—W. Sly Co.
7 ea.—½" Bench type drill press—Canedy-Otto Co.
2 ea.—6' Radial Drill, Carlton Machine Tool Co.
1 ea.—28" Drill Press—Barnes Drill Co.
1 ea.—21" Drill Press—Barnes Drill Co.

2 ea.—Singer Sewing Machines
13 ea.—12" Floor Stand Grinders—Hammond Machinery Co.
2 ea.—Crankshaft Grinder—Van Norman
1 ea.—16" Internal Grinder—Bryant Chucking Grinding Co.
4 ea.—Valve Seat Grinder—Cedar Rapids Co.

1 ea.—18" Floor Stand Grinder—Hammond Machinery Co.
1 ea.—8" Glass Grinder—
1 ea.—12" Engine Lathe—Rivett Lathe & Grinder Co.
7 ea.—Engine Lathes, size 14" to 26"—Lodge & Shipley Co.
1 ea.—Turret Lathe—Warner & Swasey Co.

2 ea.—Brake Drum Lathe—Van Norman
4 ea.—12" Lathe—Cincinnati Lathe Tool Co.
2 ea.—Honing Machines—Barnes Drill Co.
1 ea.—Lapping Machine—Norton Machinery Co.
2 ea.—Cylinder Boring Machine—Van Norman

1 ea.—Con. Rod Borrer—Van Norman
3 ea.—Line Boring Machine—Cedar Rapids Eng. Co.
1 ea.—Horizontal Millar—Cincinnati Milling Machine Co.
1 ea.—24" Shaper—Cincinnati Shaper Co.
4 ea.—Arc Welders—General Electric Co.

3 ea.—Heliarc Welders—Miller
7 ea.—Press, 5 ton to 100 ton, hydraulic, air, & detric.—Manufacturers—Lempco, Farguhar, Hy-Air, Dennison Eng. Co., Rodgers.
1 ea.—Con rod Press—Storm Mfg. Co.
1 ea.—Riveter—Townsend Mfg. Co.
2 ea.—Power Hack Saws—Peerless

1 ea.—Metal Band Saw—Grob
2 ea.—4' x 8' Press Brake—Cincinnati Shaper Co.
2 ea.—Forming Rollers—Webb Corp.
1 ea.—Rotary Shear & Flanger—Whiting Corp.
1 ea.—Nibbler—Savage & Co.

1 ea.—Jointer—
1 ea.—Planer—
1 ea.—Table Saw—
1 ea.—Band Saw—
2 ea.—Baking Ovens—

3 ea.—Heat Treating Ovens—
1 ea.—Forge—
11 ea.—Cleaning Tanks—Magnus Chemical Co.
4 ea.—Testing, & Soaking taniss for gas tanks & radiators—Magnus Chemical Co.

Shop benches, ranging in length from 6 to 35 ft., some wood tops, majority steel. Manufacturer: Standard Pressed Steel.

113 Total above items.

BUS STORAGE AREA has columns on 40 by 45 feet centers, so any bus turns into any lane without traveling to turnabout.

TWO AUTOMATIC WASHERS, with revolving brushes, handle the huge cleaning demands. They work by electric eye control.

area of the plant cost approximately $1¾ million while electrical work cost almost that much.

The main building has an overall length of 740 feet and is 322 feet wide. It is located on Fanchon Place between Bushwick and Jamaica Avenues. These avenues are on two levels so that access is gained from street to both the first and second floors. The first floor is used for bus storage, servicing and minor repairs. Its area is more than four acres. The second floor, with

COST ANALYSIS-EAST NEW YORK BUS DEPOT

Bus Garage & Shops, Paint Shop, Boiler House, Store Houses and Surface Transp. Bldg.

Total Floor Area: 585,000 Square Feet (13 Acres) **Total Volume:** 11,000,000 Cubic Feet

CLASSIFICATION	BID PRICES & ENGR'S EST.	COST PER SQ. FT.	COST PER CU. FT.
General Construction			
(a) Structural	$ 3,489,711	$ 5.96	$ 0.32
(b) Architectural	2,432,171	4.16	0.22
Plumbing Work	320,970	0.56	0.03
Electrical Work	1,207,020	2.06	0.11
Heating & Ventilating	1,706,340	2.92	0.16
Fire Protection & Fire Extinguishing	281,551	0.48	0.02
• Subtotal, Cost of Buildings	$ 9,437,763	$16.13	$0.86
Machine Tools & Equipment	$ 1,354,621	$ 2.32	$ 0.12
• Total, Cost with Equipment	$10,792,384	$18.45	$0.98

COST ANALYSIS of maintaining this mammoth operation shows the many-sided nature of supervising such a giant bus depot. Behind all this, lies the long time effort and planning of the Board of Transportation.

BUS OVERHAUL SHOP on second floor has hydraulic hoist facilities to handle 51 buses simultaneously. Buses easily gain access by ramp through doorway at rear left, for complete overhaul on bodies, chassis and mechanical units.

same area, contains the shops for complete reconditioning operations on bodies, chassis and the vehicles' mechanical units.

A mezzanine extending over a part of the second floor contains the offices, class rooms, locker rooms, toilets and a complete medical department. An L-shaped penthouse on the roof houses the 48 blowers which take care of the heating, ventilation and exhaust distribution problem for this 11 million cubic foot structure.

Operation of this giant heating and ventilating system requires 600 hp. of motor capacity; current consumption at peak is 500 kw. hr. Total blower output is 1,437,950 cubic feet per minute. This permits an air change every six minutes in the three million cubic foot garage area on the first floor. In the shop area on the second floor the air is changed every 12 minutes in the lower ceilinged area under the mezzanine and every 20 minutes in the higher ceilinged section. In the offices and class-

BODY SHOP can accommodate as many as a dozen buses at once. Handily adjacent to this busy area are the welding and blacksmith shops, and the radiator and fuel tank repair areas.

BATTERY OF SIX LATHES grind away steadily in the unit shop. This kind of topnotch tooling took an initial expenditure of $1.4 million for machine tools and shop equipment.

ENGINE RECONDITIONING LINE in the unit shop on the four-acre second floor can be bolstered by adding a second line, in adjoining space, when the plant is in full swing. Various shops are equipped with every conceivable type of maintenance machinery which a plant laid out for large volume, precision work is likely to need.

rooms the air is changed every eight minutes. The air throughout the building is filtered and tempered in accordance with the season to provide warmth in winter and fresh air in summer. A minimum winter temperature of 65 deg. F. in the garage area reduces engine warmup time. To control the fans, heaters, recirculation dampers and other apparatus on which the effectiveness of the entire heating and ventilating system depends, a control room is set up. Eadie, Freund & Campbell served as consultants on heating and ventilation.

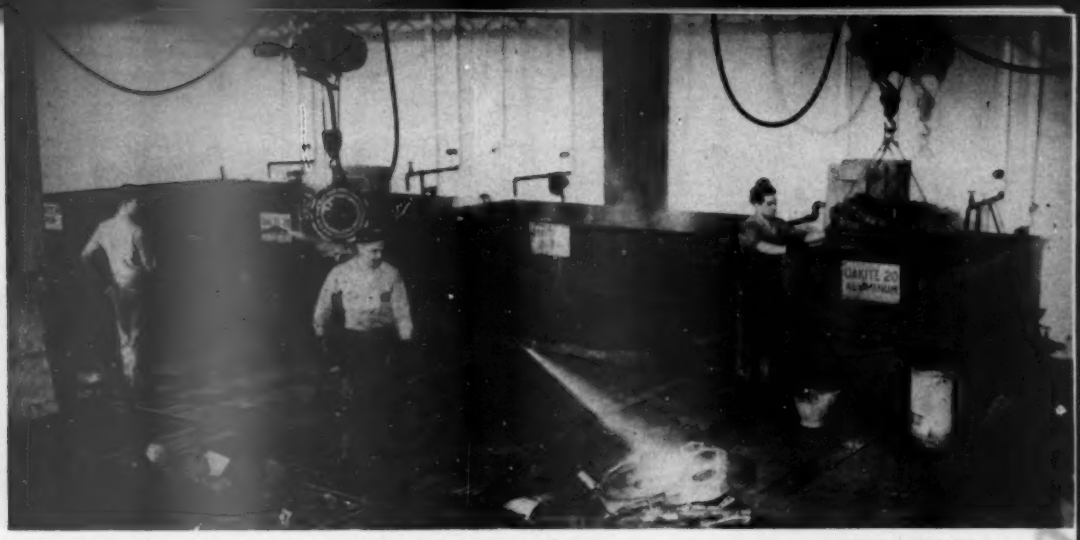
Adequate lighting, an important essential to good work, is of the fluorescent type. Light intensities maintained throughout the new plant are as follows:

- Garage area ..... 15-18 foot candles
- General Shop area ..... 15-18 foot candles
- Unit and body shops ..... 25 foot candles
- Offices for Medical Quarters ..... 35 foot candles

A lighting control system for the first floor garage section permits quick and efficient operation of all lights in accordance with a predetermined schedule, thereby assuring substantial savings in lighting cost. All control wiring is brought to a 20-push-button remote control panel with indicating lights in the Supervisor's office. By this means 100%, 50% and 10% of uniformly distributed illumination in the main storage area can be obtained quickly.

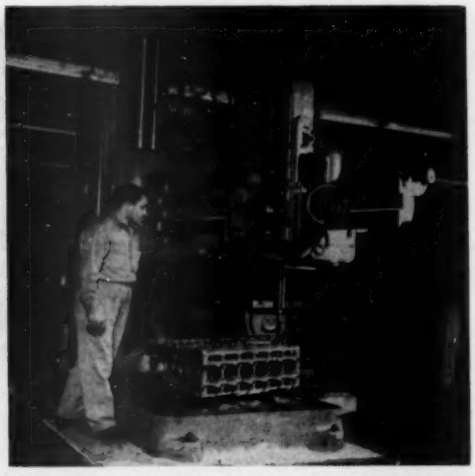
Fire Protection

Protection against fire is assured by 13 miles of pipe



PARTS CLEANING ROOM to which dismantled units are brought from the adjoining overhaul shop by a network of overhead monorail conveyors. After they are thoroughly cleaned and carefully inspected, it is determined whether the parts are in a condition to merit repair, or should be scrapped altogether. Lift trucks minimize the necessity for manual lifting of heavy units.

MEN AT WORK with a pair of heavy duty Van Norman crankshaft grinders. Excellent natural and fluorescent lighting, and monorail crane are typical of aids to efficiency provided heavy work positions.



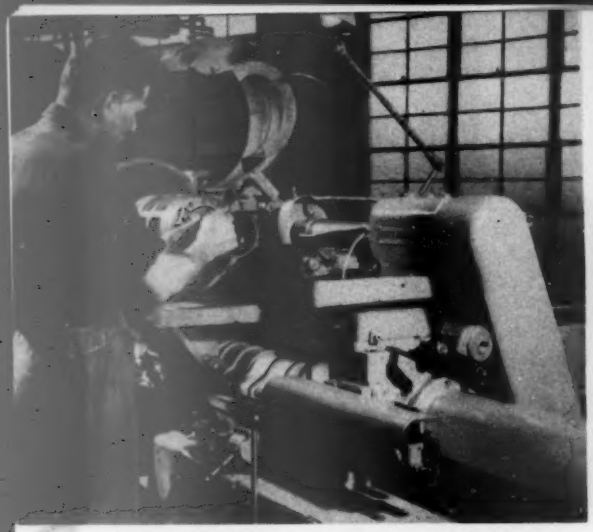
CARLTON RADIAL, with a six ft. swing and 17 inch diameter column, has an ample capacity for any kind of heavy duty drilling encountered in the shop. This is one of two in the well-equipped plant.

which supply 7,500 sprinkler heads throughout the building. These are supplemented by carbon-dioxide fire extinguishers which include twenty-six 20-lb. portables and dry-chemical units at 100 foot intervals throughout the garage and shop. There also are four 100-lb wheeled back-up extinguishers on each floor. In the oil storage area are six 20-lb. portables and two 100-lb wheeled units. In the office and storage area, 10 and 20-lb portables in sufficient numbers to protect the areas.

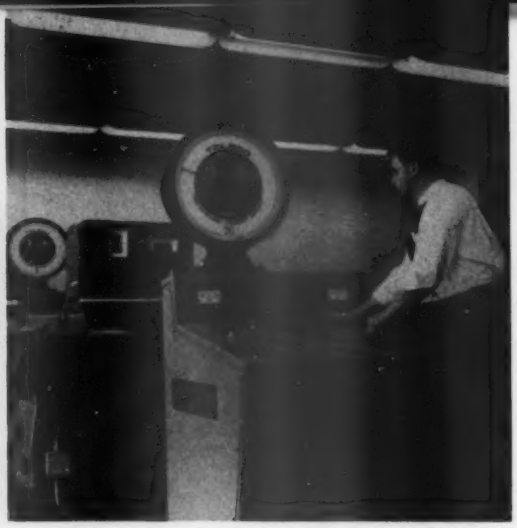
In the paint shop, still in process of construction, there will be a low pressure fire-fighting system employing a five-ton central tank for storage of carbon-dioxide. The carbon-dioxide gas will be piped to nozzles in each of three paint spray booths, a sign room and paint storage room, at which points it will be liberated by thermal or manually-actuated automatic systems. The carbon-dioxide gas also will be piped to seven reeled hose units in the paint shop and to similar units in the cleaning and stripping room. A general local fire alarm system—120-volt—is connected to 25 fire alarm stations and 24 fire gongs in the building.

Ground Floor Service and Storage Area

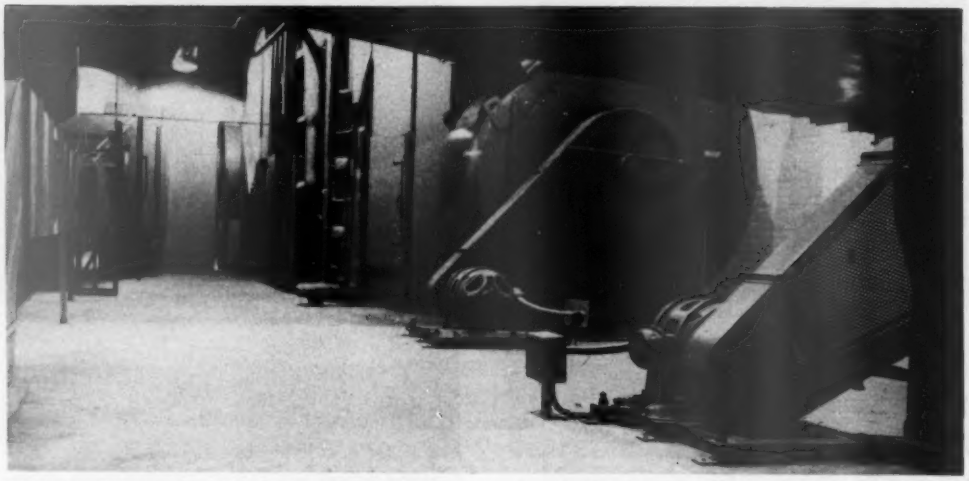
The ground floor contains service and storage facilities. To permit ease of vehicle movement in the latter, the supporting columns are spaced on 40 by 45 foot centers. This permits the longest buses to turn into any storage lane without traveling to the turn-around area at the rear of the garage. Entrance to and exit from the garage is on Jamaica Avenue. Eleven doors, occupying



BRYANT GRINDER can grind an engine sleeve to finished size in 10 minutes. The unit repair shop fairly bristles with this kind of time-saving, modern equipment, as does the entire depot.



CHECKING PERFORMANCE of the reconditioned engines, before they are reinstalled for duty in buses, is conducted through three Westinghouse dynamometers with Bowser fuel system.



HUGE BLOWERS, requiring 600 hp. motor capacity, have total output of 1,437,950 cu. ft. per minute giving an air change every six minutes in the 3 million cu. ft. garage area on first floor. In second-floor shop area, air changes every 12 minutes in lower ceilinged space under mezzanine, every 20 minutes in the higher ceilinged area, every eight minutes in offices.

practically the entire street frontage, provide rapid movement of buses. Vehicles entering the garage pass successively through a pooling area, fuel, oil and water dispensing pumps (of which there are 18), thence through an automatic bus washer and ultimately to storage.

The rear portion of the first floor is given over to inspection, lubrication, chassis cleaning, brake testing and dynamometer testing. Of the 14 hydraulic hoists in this location, eight are of free-wheeling type, four have connecting runways for drive on and two are of drive on type for chassis cleaning.

Maintenance Shops On Second Floor

The four-acre second floor in which is located the bus overhaul, body repair and unit rebuild shops contains virtually every conceivable kind of maintenance machinery a shop laid out for large volume, precision production is likely to require. A partial list of the major items of maintenance machinery to be found on this floor is given in an accompanying list. In addition to these items this floor literally bristles with hydraulic hoists. There are 57 of them, all specially designed to Board of Transportation specifications by Globe Hoist. Each hoist is provided with a tail-pipe exhaust outlet to eliminate engine fumes. Vehicle access to the second floor is by two ramps, one from Fanchon Place, the other from Bushwick Avenue. One ramp is used for entrance, the other for exit.

The bus overhaul shop has capacity to handle 51 buses

CONTROL BOARD sparkles with red and green lights which flash signals telling the heating and ventilating requirements of every section of the vast new plant. This nerve center controls the fans, heaters, recirculation dampers, and all other apparatus on which the effectiveness of the entire heating and ventilating system depends. Eadie, Freund & Campbell were consultants.

MAZE OF DUCTS conveys fresh or heated air to every quarter of the spacious 13-acre building. Air throughout the sprawling structure is tempered to coincide with the season, providing warmth in winter and coolness in summer. The 48 giant blowers, which push the air throughout the plant are housed in an L-shaped penthouse. Entire system costs $1.7 million.

simultaneously—all on hoists. Units and parts removed from buses are taken to an adjoining cleaning room for disassembly, thorough cleaning and ultimate repair or scrapping. To minimize the need for manual lifting of heavy units a battery of lift trucks serves the bus overhaul and body shops while a network of overhead monorail conveyors serves the unit overhaul department.

The functioning of the body shop and the unit shop with its battery of production machinery is a story in itself and one which will be told subsequently when these departments hit their production stride. At present these two shops are still undergoing a breaking-in process, having been in partial operation only from mid January when the new plant was opened, until late March of this year. In a project of this size it obviously takes time to get the various departments properly organized and the equipment functioning smoothly and efficiently.

The East New York Bus Garage and Shops is the culmination of long-time planning by the Board of Transportation which is headed by Col. Sidney H. Bingham, chairman, and who is internationally known as a leading authority on public transportation. Col Bingham directs the New York City Transit System with its 831 miles of subway, elevated, bus and trolley routes which each working day serve almost eight million riders.

Design of the building was executed by the Board's engineering staff under the direction of James H. Griffin, chief engineer and the various division engineers. General contractor was Psaty-Atlas.

BUS TRANSPORTATION
Maintenance Mobilization Issue
1951

Foremen Are Fired...Seldom Hired

● A SHORT TIME AGO we talked to a man who, some 20 years back, was getting his first initiation into the bus business by sweeping up the garage floor. This man didn't stick behind the broom very long, however; only long enough to win the approval of his boss by being one of the best little sweeper-uppers that ever pushed a broom.

From sweeper he successively became a greaser, a mechanic's helper and finally a first-class mechanic. By studying at home nights he paved the way for promotion to assistant foreman. His initiative led to his being boosted to foreman and ultimately to the superintendent's job. So well did he fill this latter capacity on a moderate-size operation that he was offered the berth of maintenance superintendent in an organization operating several hundred pieces of equipment. Today that man is in the front ranks of the country's successful maintenance men.

All of this leads up to the title of this article, which is based on a remark made by the man whose story we have just outlined. We had been talking about opportunities for promotion available to shop men when this superintendent stated — and it rather startled us at the time—that the foreman occasionally is fired, but seldom is he ever hired. A foreman has got to come up through the ranks in his own shop and if, by any chance, he loses out in that shop, he must start in all over again in another shop and go through the long process of climbing back up the ladder agair.

JUST AS OIL will lubricate a machine and keep it free of squeaks, so will intelligent supervision of a crew of men keep squeaks, squawks and friction among them at a minimum. The job of a maintenance superintendent or foreman has become a highly specialized job. No longer is it a purely mechanical job.

To build up a smooth-working maintenance crew with each member striving to keep costs at a minimum, a foreman must be a pretty good

judge of human nature, he must have the mechanical ability gained from experience, and the ability to gain and keep the confidence of many types of men and make them respect his judgment.

The man in charge of the mechanical condition of a fleet of coaches should not tolerate the stooge or talebearer who strives to curry favor by

carrying tales and generally undermining the other men. A foreman

who needs an informer to keep him posted as to how his men work or what they think of him personally, is not fit to be in charge. He should study his men and his job thoroughly, and not be satisfied to coast along depending on other men for his information. The stooge is a menace to a smooth-working crew.

AND WATCH OUT, Mr. Foreman, when you lay out your work. See that the work is necessary and not just a means of keeping men busy until you can think of something else for them to do. If you want to take the quickest and easiest way of losing the confidence of your men, just set them to work on a job that they know is just something to tinker with until you get back from lunch. They know that there is real work crying for attention, and they will begin to wonder if you really know your job. Continued repetition of "make work" jobs will soon result in lack of interest and half-hearted effort on their part.

A foreman, through his inspection sheets, should know the exact condition of all vehicles under his supervision, and through these sheets should be able to schedule a volume of work that will keep the shop force busy day in and day out.

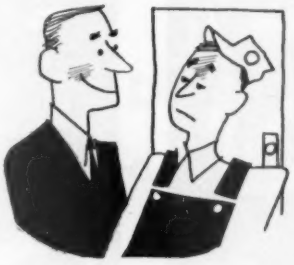
If the shop lacks an adequate inspection system, no time should be lost in installing one, even though it be of the simplest form. Neither should a foreman be averse to getting under a coach and giving it a personal looking-over.

IF A MAN is backward in his work or in any other way and needs to be called on the carpet, discipline should be carried out in the privacy of the foreman's office. To criticize a man in front of his mates will immediately turn their sympathy to the man who is getting the bawling out. And afterwards, Mr. Foreman, you will get a beautiful going over among the men. Use of diplomacy not only is advisable, it is imperative.

Recipe for a Successful Foreman

The man who started to work under a foreman, then became a foreman, and now supervises foremen, has helped the editors analyze the job in the accompanying article. How the foreman's job is viewed both from above and below is told, for the most part, in the words of one of the country's leading maintenance men. Personally, the editors feel that this practical prescription giving the ingredients of a good foreman makes a lot of sense. We could be wrong, but in any case reader discussion of the pros and cons of the matter is invited.—THE EDITORS

Bus mechanics, with few exceptions, take great pride in their work and will cooperate with the boss right



up to the hilt so long as they feel that the boss "knows his onions" and is giving them a fair deal. Favoritism, bluffing and bull-dozing is detrimental to the work in hand and creates internal friction.

A mechanic who stays in the employ of the same company over a period of several years, usually becomes a valuable asset to any foreman. Such a man will know the operating characteristics of any coach in the fleet inside and out. He will know the peculiarities and troubles encountered with certain coaches and the way out of these problem and, in his own way, will be just as valuable to the bus company he works for as the foreman himself.

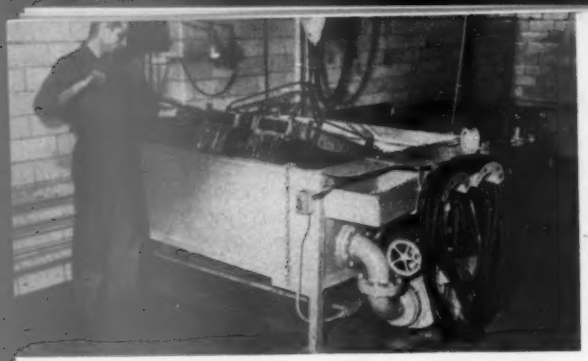
Experience has proved that good bus mechanics are hard to find. The average automobile mechanic has no conception of bus maintenance and must be "broken in" on bus work. The breaking in process may take anywhere from six months to a year.

AS FAR AS possible, men should be assigned to work for which they show the greatest aptitude. A man who shows special ability for electrical work should be given such work whenever possible, and the man who can tune an engine to perfection should get the majority of the tune-up jobs. Granted that a maintenance crew should be made up of all-around men, nevertheless a careful study will show that in most cases each man has some special ability which should be encouraged and cultivated.

Work should be fairly divided between men and different shifts of men. Dirty jobs should not be set aside for the night crew as is so often the case. Many supervisors maintain that there should be no slack periods, no spare time for their men; that men should do productive work at all times. However, a certain amount of spare time is a valuable asset, too. Spare time can be employed not sitting on the shop bench or in the wash room, but in maintaining shop tools or carrying out any ideas the men may have for new tools or devices

to save time or energy. The ingenuity of bus mechanics in this line is surprising, as the *Howjadoit* pages of BUS TRANSPORTATION testify.

SUMMING UP we come to this conclusion: that by an efficient inspection system, fair division of work, wages and hours, and a careful study of men and their ability, a smooth-running maintenance organization can be built up, one which will do its utmost, month in and month out, to keep maintenance costs at a minimum. But, at the head of this organization there must be good management and intelligent supervision all the way down the line.

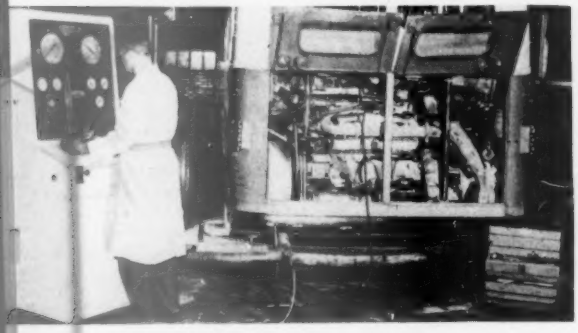


Radiator Flushing

This unit has a water pump capacity of 200 gallons per minute at eight pound pressure, and is employed to flush out radiator tubes after they have been rodded. So cleaned, radiators pay dividends in better cooling, longer engine life. ***St. Louis Public Service***

Engine Dynamometer

Last point on the engine rebuilding line is this glass-enclosed dynamometer room where the engine receives a thorough check-up before being installed in a bus. Any faulty operation is caught here before it becomes a road failure. ***San Antonio Transit***



Chassis Dynamometer

This dynamometer provides a simulated road test which is more accurate and less time-consuming than an actual road test, and puts reconditioned buses through their trial workouts in the New Haven and Hartford shops. ***The Connecticut Co.***

Magnaflux Crack Detection

Critical items are carefully checked on this unit to discover hidden flaws which, if undetected, might be the cause of an accident. Once checked, the inspector then determines whether the part in question shall be scrapped or salvaged. ***San Antonio Transit***

Quick Charger

This portable Hartman battery charger brings a run-down battery up to par without removing it from the coach. Compact and easy to use, it is a valuable aid. ***St. Joseph Light and Power***

Welding Shop

Acetylene and oxygen gas are piped to welding area from central reservoirs outside the shop. Note ventilating funnel with adjustable gooseneck to carry away objectionable fumes. ***San Antonio Transit***

Front End Check-up

Tire pressure, wheel alignment, camber, caster, king pin inclination, brake and steering are checked frequently. It pays off in terms of safety and accident prevention. ***Dixie Traction Co.***

Unit Overhaul Shop-1951 Model

This modern machine shop is equipped with every tool needed to rebuild or repair a modern bus or trolley coach. Two hundred thirty bus engines and 31 trolley coach motors is a year's production for the bustling shop. ***United Electric Railways***

Towmotor Lift Truck

All sorts of heavy, awkward lifting is easily handled by this versatile, maneuverable power truck. Here the trim vehicle is shown handling a pair of ponderous bus springs with the greatest of ease, typical of its use about the shop. ***Southern Penna Bus Co.***

Saving Maintenance Dollars With Modern Shop Equipment

BUS TRANSPORTATION
Maintenance Mobilization Issue
1951

Pictured here are some of the time and material saving machines which are being used with dollar saving advantages by the 1950 winners of the BUS TRANSPORTATION M E Awards.

DeVilbiss Spray Booth

Hydraulic lift permits bus to be dropped below the floor level when refinishing the top, or raised to convenient working height when painting lower panels and wheels. ***San Antonio Transit Co.***

Regulator Test Stand

Device is easy to operate, with no wires to connect, as all wiring is connected on back of board clips. Regulator is merely slipped into clips and terminal post nuts tightened. ***St. Louis Public Service***

60-Ton Shop Press

Three and a half hours saved on a sleeve replacement job. Formerly, it took four hours, now it's done in a half hour with a Rodgers 60-ton press. ***The Connecticut Co.***

Continued on next page

BUS TRANSPORTATION
Maintenance Mobilization Issue
1951

Saving Maintenance Dollars With Modern Shop Equipment . . .

continued

Camshaft Profile Jig

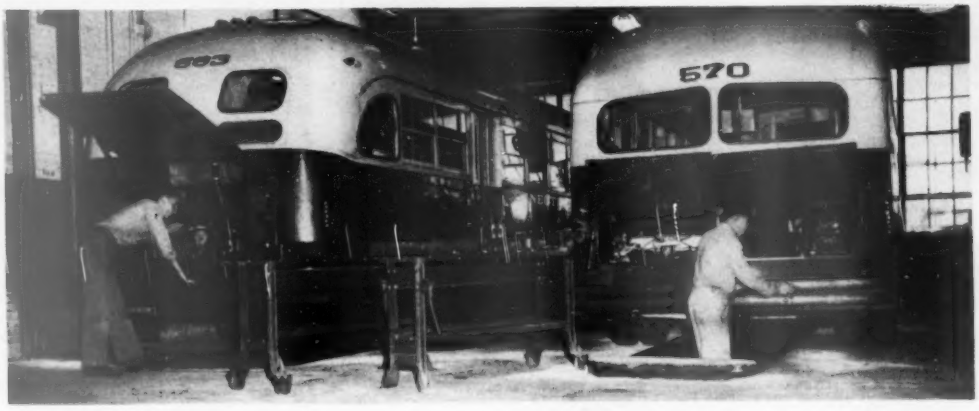
After scored and worn camshaft is reclaimed by welding and ground, jig checks profile for hand stoning to exact size. Stones and bluing give fine finish. **St. Louis Public Service**

Van Norman Brake Lathe

Here a scored brake drum is reclaimed on heavy-duty special purpose tool, conserving vital material. ***Harrisburg Railway Co.***

Clutch Test Stand

This stand enables mechanic to determine how many shims are needed before installing assembly in bus. **St. Louis Public Service**



Portable Benches Save Time

Maintenance work is performed more quickly and easily with the aid of portable benches which are brought to the work. Formerly all such work as is going on here had to be carried to the bench, completed, and then carried back again. This scene of a Meriden shop gives some idea of the advantages in time and energy gained through portable benches. **The Connecticut Company**

Replacing Damaged Body Panel

In this phase of body repair, replacing a damaged body panel, the man shown is using a Cherry rivet machine and rivets. All the replacement panels are of aluminum. This is a good instance of "repair" work, as distinguished from "maintenance" in the box below, since it restores equipment to sound condition after it has been made unfit for service. ***Palmer Motor Coach Service***

Man Saving Money

Electric arc transforms a worn-out brake camshaft into a serviceable unit, good for thousands of miles. ***Harrisburg Railway Co.***

Bridgeport Milling Machine

Salvaging a White transmission gear is just one of many precision jobs this piece of equipment will handle. ***Houston Transit Co.***

Wheel Removal Dolly

Removing dual rear wheels, once a tough job, is relatively easy with this portable wheel dolly. ***Southern Penna Bus Co.***

Maintenance or Repair . . .
. . . Which Do You Do?

Here's the difference between "Maintenance" and "Repair" as defined in National Production Authority Regulation No. 4.

"MAINTENANCE" means the minimum upkeep necessary to continue any plant, facility or equipment in sound working condition.

"REPAIR" means the restoration of any plant, facility or equipment to sound working condition when it has been rendered unsafe or unfit for service by wear and tear, damage, failure of parts, or the like.

Details of Training Courses at CTA's Maintenance School

Mechanical—Bus Repairman

This course consists of the following strip films.
a—Internal combustion engine (3 films)
b—Carburetion and fuel feed systems (2 films)
c—Engine lubrication and cooling systems (2 films)
d—Brakes and braking systems (5 films)
e—Clutch and transmission (3 films)
f—Rear axle and drive shaft (4 films)
g—Springs and shock absorbers (2 films)
In addition there are 24 hours of shop work which cover use and function of hand tools and application of theory gained in school.

Electrical—Bus Repairman

This course uses strip film dwelling on electrical fundamentals and leading up to application of these principles in operation of gasoline motor coaches.
a—Magnetism and static electricity (2 films)
b—Current electricity and electro-magnetism (2 films)
c—Batteries and generators (2 films)
d—Alternating current (1 film)
e—Voltage regulation and meters (2 films)
f—Ignition (1 film)
g—Starting motors and controls (1 film)
Simultaneously the trainee receives shop experience in ignition trouble diagnosis and tune-up, and all phases of gasoline bus electrical trouble shooting.

Electrical—PCC Car, Trolley Bus and Elevated and Subway Cars

This course trains student in elementary electrical fundamentals, which prepares him for specialized training necessary to maintain PCC, Elevated and Subway cars and Trolley Buses. Course is essentially same as for gasoline bus maintenance men except for omission of ignition and starting motor training. In its place men are given training on traction motors, extensive blueprint reading and electrical troubl shooting. Appropriate strip films, developed at the school, are employed.

PROGRAM HAS BEEN BUILT UP OVER A FIVE-YEAR PERIOD, WITH COURSES BEING ADDED STEADILY TO MEET THE NEED...

Trained Manpower Is Better Manpower

Chicago Transit Authority's Maintenance Training Program is now in its fifth year. A total of 958 student-employees have attended various courses since the school first opened in May 1947.

● BACK IN 1947, Chicago Surface Lines, now a part of the Chicago Transit Authority, was engaged in an accelerated modernization program. In converting from older type street cars and buses to modern streamlined motor buses, trolley buses, and PCC cars it was apparent that an appropriate employee training program was urgently needed. In fact, it was necessary, if men schooled in the more tolerant shop practices employed with older street cars and less complex prewar buses were to master the more exacting procedures needed to keep present-day automotive and electric transit vehicles functioning properly.

The maintenance school was opened in May 1947 at the Division-Western carhouse. First classes—two four-hour sessions a week—were limited to foremen and assistant foreman of the maintenance department, in order to acquaint supervisory personnel with the type of training to be offered to shop men.

The school was an immediate success and the reaction of shop men, who were quick to realize that trained

Torque Converter—Spicer

Training material for this course is as follows:

a—Review of strip film on engine theory.

b—Pertinent strip film on the Spicer converter and the engines with which used as well as other related units or torque converter.

c—Extensive shop training in trouble shooting and diagnosis with aid of special test equipment.

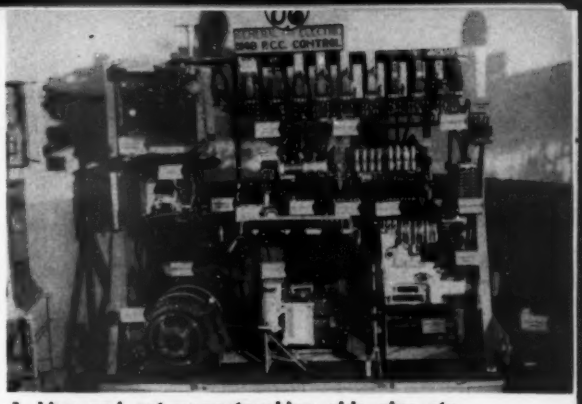
d—Road-test training in which specific troubles are developed with apparatus designed for that purpose.

Hydro-Torque—White

This course follows a pattern similar to the course on the Spicer unit. Engine trouble shooting and tune-up also is included on specific powerplant used with this transmission.

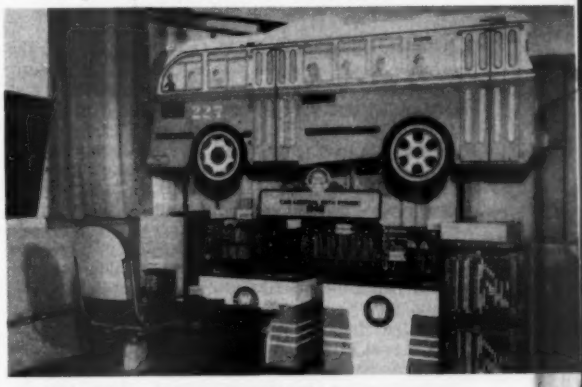
Diesel Engine—GM Coach

This course is predicated on use of diesel engine strip films, diesel engine charts, and cut-away engine. Shop work is performed in garages where diesel operated coaches are serviced.



1. Live and cut-away teaching aids give students the whole picture on . . .

Everything from PCC car control . . .



2. And trolley bus cam control to . . . →

...ALL COURSES GET TO THE "INNARDS" OF SUBJECT

manpower is better manpower, was so favorable that facilities had to be expanded almost before the school had gotten properly started.

Within four months three new courses were added and classes in all courses placed on a five-day week basis. Shortly thereafter night classes were started at the request of men on the night shift who also were eager to increase their knowledge.

Futher expansion from time to time necessitated more space until the school now takes up the entire west portion of the Division carhouse. As new courses were added they attracted more interest resulting in an influx of student trainees. This necessitated more instructors.

In planning the initial training courses, the main consideration was the immediate and specific needs of a shop force going through a transition period from one type of equipment to another and with unfamiliar techniques involved. But sight was not lost of the importance of a continuing program which would help build and maintain a well-trained force.

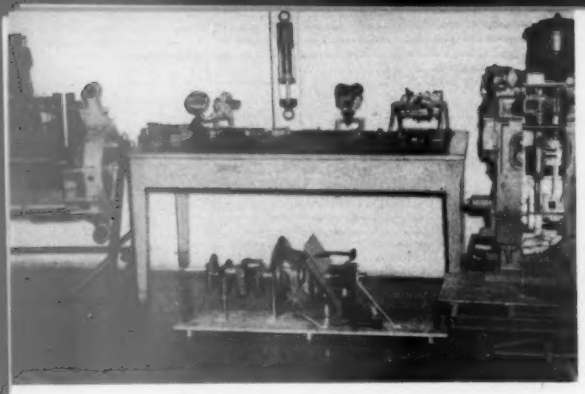
In working out the courses, thought was given to the complexity or simplicity of the problem involved in the department for which the training was to be given. In determining when to hold classes, three factors were considered, namely, working schedules and shifts, fatigue and strain resulting from work, and transportation. Size of classes and method of teaching was determined by the subject material.

Classes—How Conducted

Classes are conducted on the basis of the student attending one eight-hour session per week until the course involved is completed. Most courses are of three-month duration, 12 weekly sessions or a total of 96 hours. Class sessions start at 8 a.m. and continue to 4:30 p.m. Time spent in class is about equally divided between necessary theory and actual shop work, thus giving the student an opportunity to put theory into practice. The student is paid at the same rate while in school as if he were at work in the garage or carhouse.

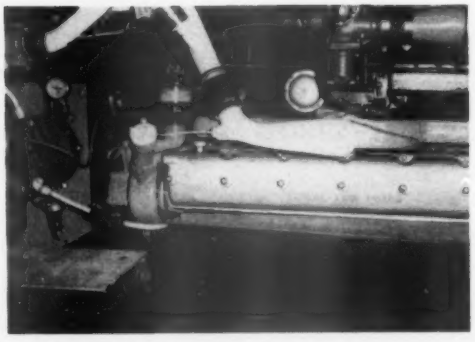
Students are not limited to any one course but may elect to take additional instruction as time is made available. Many students have availed themselves of the chance for further study.

In classroom practice many mediums are employed to convey information. Visual aids, such as film strips, silent and sound motion pictures, charts and slides, are used liberally on the well-proved theory that one picture is worth ten thousand words. Cut-away models, mock-ups and actual operating units also are employed

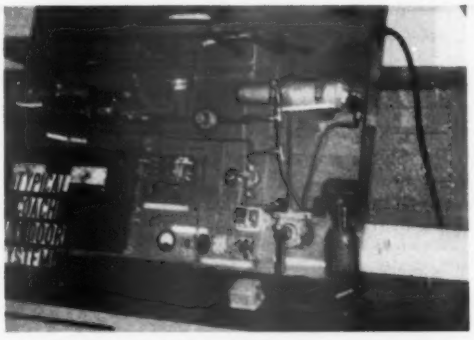


→ 3. Cut-aways (gasoline engine, diesel) . .

4. And Faegol Twin Coach powerplant . . .



7. Visual aid as do propane fuel system, . . .



9. Typical bus air door system . . .

extensively. Blackboard discussions—chalk talks—by the instructor figure prominently in classroom procedure. Students are furnished texts, pamphlets and current literature dealing with subjects under discussion. These become his property for furture reference.

Classes are conducted on an informal basis and students are urged to enter into discussions with the instructor and among themselves, with the idea that this will stimulate thought and arouse interest. Classes are kept small to permit more individual instruction. Tests are given periodically and serve a two-fold purpose. The tests tell the instructor whether his teaching has registered, helps the student retain the instruction, and permits him to gain knowledge of his progress. The number of students from any particular maintenance depot is held to a minimum in order to prevent undue hardship to the working force at any one depot.

Instructors for the various courses offered are obtained from the ranks of the maintenance men themselves. These men are chosen by the school supervisory personnel for their outstanding classroom and shop work, practical background, interest in the subject, appearance and ability to get along with men.

Prior to class contact, a new instructor is given intensive training in the course he has been picked to teach. He is given further training to improve his teaching ability, speech and teacher conduct. During this time he is assigned to observe other classroom teaching techniques and is permitted to assist that instructor in conducting classes. Thus he gains practical experience until qualified to be a full-time instructor.

Instructors are observed from time to time by the School supervisory staff and suggestions for improvement given if needed. Instructors also attend weekly training classes when new topics are discussed, new teaching films shown and open discussions held on new and better teaching methods. They also do considerable outside research in order to keep up on new developments constantly occurring in the transportation field.

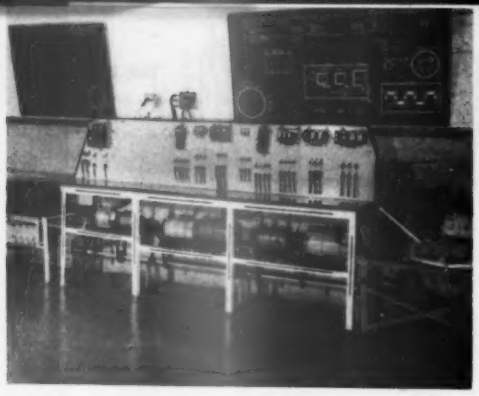
Curricula

The curricula consists of three month (96 hours) classes in the following subjects: mechanical, electrical, torque converter and engine trouble shooting (Twin Coach), Hydro-torque and engine trouble shooting (White) diesel engine training (GM diesel). Details of these courses are covered in an accompanying box:

Physical Teaching Aids

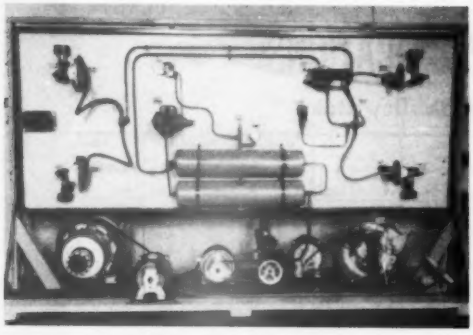
The CTA school rooms contain one of the most complete assortment of physical teaching aids imaginable. Nothing has been overlooked that will help the student get a better grasp of the "innards" of a transportation vehicle—either motor propelled or electrically operated. There are ingenious working models of the major components of the motor bus, trolley bus, PCC car and elevated and subway cars. There are cutaway models, charts, diagrams and exhibits—all with the idea of making clear the proper functioning or the mal-functioning of a mechanism.

Some of these teaching aids have been supplied by manufacturers who have shown high interest in the

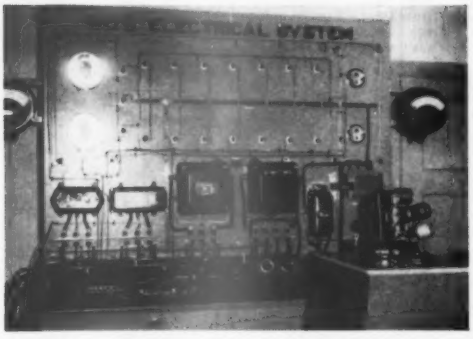


5. Instruction panels are also part of . . .

6. Props, and stripped chassis gives . . .



8. Bus air brake board and this . . .



10. And complete bus electrical system.

training of men who service their products. Other aids were procured by outside purchase, while still others were constructed at the school of supervisory force with student assistance.

Among the teaching "props" for motor bus classes are cut-away engines including a Fageol Twin Coach gasoline engine, a White 12-cylinder unit, a Chevrolet (live) engine, White coach chassis and live engine, Chevrolet cut-away chassis with 1942 engine, exploded models of Spicer torque converter and White Hydro-torque transmissions, Fageol engine (propane) with torque converter and dynamometer attached. There also are operating mock-ups of air brake systems with compressors, operating generators with voltage regulators, ignition, carburetion and fuel feed system cut-aways.

For the electric vehicle classes there are complete PCC car control equipment with motor, actuator, drum and track brake control of both General Electric and Westinghouse designs. There is a complete Westinghouse Electro-Cam trolley bus control unit and bus mock-up, National Pneumatic treadle door with all controls, complete Electric Service windshield wiper set up, Consolidated Car solenoid sander unit, Vapor Heating damper control, General Electric and Westinghouse motor generator and voltage regulators.

In addition, there are numerous non-working exhibits, such as exploded units, portable displays, wall charts as well as the various instruments needed to teach and explain basic fundamentals. The latter includes static machines, small motors, meters, electric cells, condensers, contactors, relays and transformers.

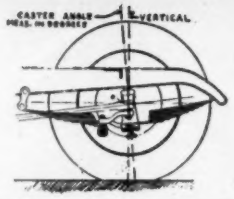
Results of the Program

During the five years the school has been in operation, 958 students have attended various courses of instruction. Of these 713 have completed electrical phases of study and 609 at least one course in the mechanical phase of the curricula. Of the latter, quite a number also have completed courses in other subjects in addition to the original studies undertaken. (These figures are as of April 11, 1951 and do not include men who took the course but are no longer with CTA).

The school operates on a full time basis of five days per week. In addition to regular courses, special classes of short duration have been held on particular subjects such as spark plugs, tires, snow removal equipment. Also there are classes to give foremanship training to supervisory personnel.

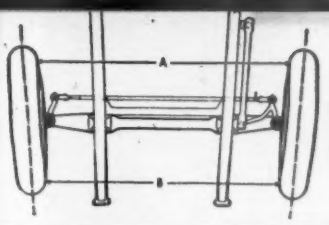
The measure of the school's success is best determined by its effect on the maintenance program. Experience definitely indicates that economy of operation has been gained through improved service and availability of equipment. Unquestionably, the program has given the trainees a higher standard of approach to the problems of maintenance. This means better workmanship which in turn leads to longer equipment life and consequently, lower costs.

Summed up, it can be said that the technical knowledge placed within the reach of the maintenance personnel has developed added interest in the work at hand, has stimulated thought, alertness, new ideas and pride in good workmanship.



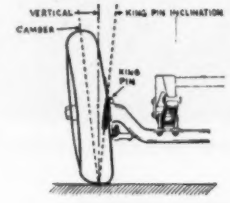
CASTER

Caster angle measured in degrees.



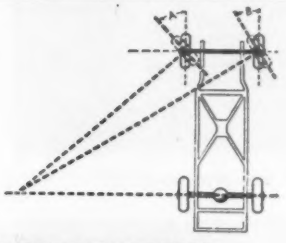
TOE-IN

Measure difference between "A" and "B" in inches.



KING-PIN CAMBER and INCLINATION

Camber angle measured in degrees.



TURNING RADIUS

Measure angle "B" in degrees when angle "A" is 20 degrees.

FRONT END SPECIFICATIONS

1951 Motor and Trolley Bus

	MOTOR BUS MAKE	MODEL	YEAR	Caster Angle in Degrees		Toe-In In Inches		Camber Angle In Degrees		King-Pin Angle In Degrees		Turning Radius in Degrees	
				°Max.	°Min.	Max.	Min.	°Max.	°Min.	°Max.	°Min.	°Max.	°Min.
1	ACF-Brill	IC-41A	1951	2	1	1/16	0	1	1	5½	5½	18°24′	
2	ACF-Brill	SU-37	1951	2	1	1/16	0	1	1	5½	5½	16°47′	
3	ACF-Brill	C-27	1948-51	1½	1½	1/16	0	1	1	8½	8½	17 5/12	17 5/12
4	ACF-Brill	C-31	1949-51	1½	1½	1/16	0	1	1	8½	8½	17 5/6	17 5/6
5	ACF-Brill	C-44	1947-51	(a)		1/8	1/8	1	1	5½	5½	18 1/3	18 1/3
6	Beaver	B-35 PT	1951	2	0	3/32	1/16	1	1	5½	5½	20	18
7	Beaver	B-31 PT & B-27 PT	1949-50	2	0	3/32	1/16	1	1	8½	8½	20	18½
8	C. D. Beck	Beck-29	1951	3	2	1/8	1/16	1	1	8	8	–	–
9	C. D. Beck	"5000" Mainliner	1951	3	2	1/8	1/16	1	1	5½	5½	–	–
10	Chevrolet	3802, 4502 & 6702	1949-51	3¼	2¼	1/4	1/16	1½	½	8 1/6	6 1/6	25	21
11	Cub Coach	18S "B" Series & 21T "B" Series	1951	3	1	1/16	0	**1	¼	8	7¼	–	–
12	Dodge	B-3-FS	1951	2°38′	1°38′	1/8	1/16	2	2	7	7	39	39
13	Dodge	B-3-GH, B-3-HHS	1951	2°14′	1°19′	1/8	1/16	2	2	7	7	39	39
14	Dodge	B-3-JS	1951	3½	2½	1/8	1/16	2	2	7	7	39	39
15	Fitzjohn	310 Cityliner	1944-51	2	1½	1/8	1/16	1 Positive	0	8	–	18¼	–
16	Fitzjohn	FTG Cityliner FTD Cityliner	1950-51	2	1½	1/8	1/16	1 "	0	5½	–	18¾	–
17	Fitzjohn	510 Duraliner	1946-51	2½	2	1/8	1/16	1 "	0	8	–	19	–
18	Fitzjohn	635 Super Duraliner	1949-51	2½	2	1/8	1/16	1 "	0	8	–	19¼	–
19	Flxible	218B1-51, 218B6-51, 218B7-51, 218DWXI-51, 218DWX7-51 & 182B1-51	1950-51	2	2	1/8	1/16	1	1	5½	5½	18	17 14/15
20	Gen. Amer. Aeracoach	373	1951	1 5/8	1 3/8	1/8	1/16	1	1	8½	8½	18	18
21	G.M.C.	TGH-2708 & 3101	1951	½	–	1/8	1/16	1	–	8½	–	17¼	–
22	G.M.C.	PD-4103	1951	3½	*	1/8	1/16	1	–	5½	–	18½	*
23	G.M.C.	TDM-TDH-4010	1951	3¼	*	1/8	1/16	1	*	5½	*	18½	*
24	G.M.C.	TDM-TDH-4509 & TDH-5103	1951	2	*	1/8	1/16	1	*	5½	*	18 7/10	*
25	G.M.C.	PDA-3704	1951	2	*	1/8	1/16	1	*	8	*	18 7/10	*
26	G.M.C.	TDM-TDH-3612 & 3209	1951	3¼	*	1/8	1/16	1	*	8	*	18 7/10	*
27	Kalamazoo	K8	1948-51	1⅜	1½	1/8	1/16	1	1	4	4	17 9/15	17 13/30
28	Mack	C50	1950-51	3½	3	1/16	0	1	1	7	7	18¾	18¼
29	Mack	C-33 & C-37D	1947-51	3½	3	1/8	1/8	1	1	7	7	19	18
30	Mack	C-41 & C-41D, C-45 & C-45D	1947-51	3½	3	1/8	1/8	1	1	7	7	17 5/8	17 5/8
31	Marmon Herrington	8MB	1950-51	3¼	2½	3/16	1/16	**1	**½	8	8	18	17½
32	Marmon Herrington	8M2B	1950-51	3¼	2½	3/16	1/16	**1	½	8	8	18	17½
33	Reo	33-37-41 CB & TB	1950	5	4½	1/8	1/16	1	*	8	*	18	*
34	Southern Coach	S-41 & S-36	1950-51	3½	1	3/16	1/16	1	1	5½	5½		
35	Southern Coach	F-31M & F-35M	1948-51	3½	1	3/16	1/16	1	1	5½	5½		
36	Superior	SG-6105, SG-6705, SG-7305	1951	2	1½	1/8	1/16	1		5½		20	18½
37	Transit	01	1951	3	3	1/8	1/16	1	1	8½	8½	18½	*
38	Twin Coach	52-S	1951	1⅛	1¼	+1/16	0	1	1	6	5	44 @ King-pin	
39	Twin Coach	34-S & 38-S	1950-51	1⅛	1¼	+1/16	0	1	1	6	5	17	16
40	Twin Coach	41-S, 44S & 44-P	1950-51	1⅛	1¼	+1/16	0	1	1	6	5	18	17
41	White	1144-D	1951	1½		1/8		1		5½		35****	
42	White	1136, 1136-S, 1140, 1140S, 1144 & 1144S	1950-51	1 5/6	*	1/8	*	1	*	8½	*	‡28½	*
	TROLLEY BUS												
43	ACF-Brill	TC-46 & TC-48	1950-51	1⅜	1⅜	1/8	1/8	1	1	5½	5½	184/15	184/15
44	Marmon Herrington	TC-44 & TC-48	1950-51	1½	1½	3/16	1/16						
45	Pullman-Standard	1951 – 40′ 0″	1951	2 1/6	2 7/6	1/8	1/8	1	1	5½	5½	182/5	182/5
46	St. Louis Car Co.	TC-44 & 48	1947-51	1	¾	1/8	1/10	1	¾	5½	*	22	*
47	Twin Coach	44TT & 58TT	1949-51	1¾	1¼	+1/16	0	1	1	6***	5	17	16

* – No information.
‡ – Based on Angle "A" of 40 Degrees.
\+ – Toe-Out
** – Camber of each wheel must be within 1/2° of each other.

*** King pin angle on rear axle of 58TT is 8°.
**** Based on angle "A" of 45°.
(a) Caster is –⅝° to –1⅛° (all 1951 models) 1947-50 + 1⅛° to +2¼°.
Note: For information on prior models, see June issue in corresponding year.

ENGINE TUNE-UP SPECIFICATIONS—1951

	Bus Make and Model	Engine Make and Model	No. Cylinders – Cylinder Head Type	Bore, In.	Stroke, In.	Maximum Horsepower	At Most R.P.M. (a Max. H.P. developed)	Compression Ratio	Compression Pressure at Starter Speed, Lb. sq. in. (Note 1)	Engine Firing Order	IGNITION							
											Spark Plug and Number	Distributor Make and Number	Spark Plug Gap, In.	Breaker Gap, In.	Cam Angle, Deg.	Engine Timing, Deg. (Note 2)	Distributor Advance-Deg.	
																	Manual	Centrifugal	Vacuum	Type Advance
1	ACF-Brill C-27	Inter RD 372	GI	4 3/8	4 1/8	140	2850	6.3	116.5d	1-5-3 6-2-4	AC-43 Con AL AN5 CH J6	D 1112357	.028-.032	.018-.024	35	5+	...	22	..	A
2	ACF-Brill C-31	Inter RD 406	GI	4 3/8	4 1/2	149	2750	6.3	120d	1-5-3 6-2-4	AC-43 Con AL AN5 CH J6	D 1112357	.028-.032	.018-.024	35	5+	...	22	..	A
3	ACF-Brill SU-37	Inter RD 450	GI	4 3/8	5	162	2800	6.2	122.5d	1-5-3 6-2-4	AC-43 Con AL-AN5 CH-J6	D 1112357	.028-.032	.018-.024	35	5+	...	22		A
4	ACF-Brill C44	Hall-Scott-180-1	GI	5	6	208	2200	6.	116	1-5-3 6-2-4	CH-6	D-4144	.025	.024	37	10+	30	22	15	A
5	ACF-Brill IC-41A	Hall-Scott-190-2	GI	5 1/4	6	228	2200	5.6	114	1-5-3 6-2-4	CH-6	D-4144	.025	.024	37	10+	30	22	15	A
6	Beaver B-25-PT, B-31-PT	International Red 361	GI	4 1/8	4 1/2	126	2700	6.3	100	1-5-3 6-2-4	AC-43 Con	D- 1110167	.028-.032	.018-.024	35	11+	...	22	▶	V
7	Beaver B-35-PT	International Red 450	GI	4 3/8	5	148	2400	6.3	110.6	1-5-3 6-2-4	AC-43 Con	D- 1110167	.028-.032	.018-.024	35	TDC	...	22	▶	V
8	Beaver B-29PT	International Blue Diamond 269	GI	3 9/16	4 1/2	100.5	3000	6.3	114.6	1-5-3 6-2-4	AC-43 Con	D- 1110118	.028-.032	.018-.024	35	3+	...	28	..	A
9	Beck Silverliner	Cummins NHB-600	GI	5 1/4	6	200	2100	15.5	500-525	1-5-3 6-2-4	.....	.....	.....	.....	...	...	...	...	..	...
10	Beck Luxury Liner	Continental R-6536	GI	4 13/16	5 3/8	200	2600	6	125-150	1-5-3 6-2-4	Ch-5 Con	D- 1112253	.018 .024	.018-.024	...	5+	...	36	..	A
11	Beck Super Steeliner	International Red 361	GI	4 1/8	4 1/2	126	3000	6.3	110-160	1-5-3 6-2-4	AC-43	D- 1110167	.028-.032	.018-.024	...	4+	...	26	..	A
12	Beck-29	Cummins JBS-600	GI	4 1/8	5	150	2500	600	15.5	1-5-3 6-2-4	.....	.....	.....	.....	...	...	...	...	..	...
13	Beck "5000" Mainliner	Inter. RD-450	GI	4 3/8	5	162	2800	6.2	1225	1-5-3 6-2-4	CH J6	D- 1112357	.028 .032	.018 .024	85	5+	...	22	..	A
14	Chevrolet 3802, 4502	Own T/Master	GI	3 1/2	3 3/4	92	3400	6.6	110	1-5-3 6-2-4	AC-44 5 Con	D- 1112362	.035	.018	34	5 BTC	...	36	10	VA
15	Chevrolet 6702	Own L/Master	GI	3 9/16	3 15/16	105	3600	6.7	110	1-5-3 6-2-4	AC-44 5 Con	D- 1112363	.035 .025	.018 .024	34	5 BTC	...	31	10	VA
16	CUB Coach 16-S "B" Series	Ford 9 H-J	GI	3.300	4.400	95	3300	6.8:1	110	1-5-3 6-2-4	Ch-H9	Ford	.028	.026	...	TDC	...	...	22	VA
17	CUB Coach 21-T "B" Series	Ford 9 H-J	GL	3.300	4.400	95	3300	6.8:1	110	1-5-3 6-2-4	Ch-H9	Ford	.028-.032	.026-.034	...	TDC	...	...	22	VA
18	Dodge B-3-FS, B-3GS	TS-314, TXS-314	GL	3 7/16	4 1/4	109	3400	.....	6.6	1-5-3 6-2-4	AL ARSA	AL IAY4004	.035	.020	38-40	TDC	...	24	...	A
19	Dodge B-3-HNS	TS-316	GL	3 7/16	4 1/4	109	3400	.....	6.6	1-5-3 6-2-4	AL ARSA	AL IAY4004-1	.035	.020	38-40	TDC	...	24	...	A
20	Dodge B-3-JS	TS-318	GL	3 7/16	4 1/2	114	3400	.....	6.6	1-5-3 6-2-4	AL ARSA	AL IAY4004-1	.035	.020	38-40	TDC	...	24	...	A
21	Dodge B-3-RS	TS-330	GL	3 3/4	4 5/8	122	3200	.....	6.4	1-5-3 6-2-4	AL ARSA	AL IAY4003-1	.035	.020	38-40	TDC	...	22	...	A
22	Fitzjohn 310 & FTG Cityliner & 510 Duraliner	Herc. JXLD	GL	4	4 1/2	131	3000	125A	6.2	1-5-3 6-2-4	AL TTY	D 1110300	.025	.018	35	TDC	...	22	...	A
23	Fitzjohn FTG Cityliner	HERC. WXLD	GL	4 1/4	4 3/4	140	3000	125A	6.2	1-5-3 6-2-4	CH J-6	1110300	.025	.018	35	TDC	...	22	...	A
24	Fitzjohn FTD Cityliner	HERC. DWXLD	GL	4 1/4	5	142	2600	.....	15.5	1-5-3 6-2-4	.....	.....	.....	.....	...	...	...	...	...	...
25	Fitzjohn 635 Super Duraliner	WAUK. 140GK	GI	4 1/2	5 1/2	176	2600	90B	6.2	1-5-3 6-2-4	CH H-9	O 1111775	.025	.018 .024	35	TDC	...	30	...	A
26	Flexible 3781, 2981, 2581, 2181	FB 320	GI	37/16	4 5/16	144	3600	6.1	110	1-5-3 8-3-7-4	AC-48	Delco Flexible	.040	.018	31	6+	...	26	18	AC
27	Flexible 2188 1-59	Fx-320	GI	3 7/16	4 5/16	144	3600	6.1	110	1-5-3 8-3-7-4	AC-46X	Delco Flexible	.04	.018	31	6+	...	26	18	AC
28	Flexible 2180WX1-51, 2180WXJ-51	Hercules DWXLD	GI	4 1/4	5	142	2600	15	.....	1-5-3 6-2-4	.....	.....	.....	.....	...	...	...	...	...	...
29	Gen. Amer. Aerocoach 372 MH	Intinarv. RED-50	GI	4 3/8	5	148	2600	6.3	115	1-5-3 6-2-4	Com. AC-43	D- 1110167	.025	.020	35	0°	...	26	...	...
30	Gen. Amer. Aerocoach T-361	Continental U6501	GI	4 1/2	5 1/4	170	2400	6.4	125	1-4-2 6-3-5	Com. AC-82	D- 1112361	.025	.020	35	5°	...	30	...	...
31	Gen. Amer. Aerocoach T-361	Hercules DRXCC	GI	4 5/8	5 1/4	147	2200	15	750 110	1-4-2 6-3-5	.....	.....	.....	.....	...	...	...	...	...	...
32	GGen. Amer. Aerocoach T-451	Continental R-6572	GI	4 3/4	5 3/8	210	2500	6.7	120 110	1-5-3 6-2-4	Ch-5 Com	.....	.025	.020	...	10° B-406	...	...	...	A
33	Gen. Amer. Aerocoach 373	Continental U6501	GI	4 1/2	5 1/4	170	2400	6.14	120	1-5-3 6-2-4	Com AC-82	D- 1112265	.025	.020	35	5°	...	30	..	C

ENGINE TUNE-UP SPECIFICATIONS, continued

| | Bus Make and Model | Engine Make and Model | No. Cylinders – Cylinder Head Type | Bore, In. | Stroke, In. | Maximum Horsepower | At What R.P.M. is Max. H.P. developed? | Compression Ratio | Compression Pressure at Starter Speed, Lb. sq. in. (Note 1) | Engine Firing Order | IGNITION | | | | | | | | | VALVES | | | | | | | | |

| | PISTONS | | | | | | | | FUEL SYSTEM | | | | | | | |

ENGINE TUNE-UP SPECIFICATIONS—1951

	Bus Make and Model	Engine Make and Model	No. Cylinders — Cylinder Head Type	Bore, In.	Stroke, In.	Maximum Horsepower	At What R.P.M. is Max. H.P. developed?	Compression Ratio	Compression Pressure at Starter Speed, Lb. sq. in. (Note 1)	Engine Firing Order	IGNITION: Spark Plug and Number	Distributor Make and Number	Spark Plug Gap, In.	Breaker Gap, In.	Cam Angle, Deg.	Engine Timing, Deg. (Note 2)	Distributor Advance-Deg.: Manual	Centrifugal	Vacuum	Type Advance	Advance Begins at What Engine R.P.M.?	Advance Ends at What Engine R.P.M.?	VALVES: Make Valves	Intake Valve Material	Exhaust Valve Material	Intake: Head Diameter, In.	Intake: Stem Diameter, In.	Intake: Seat Angle, Deg.	Exhaust: Head Diameter, In.	Exhaust: Stem Diameter, In.	Exhaust: Seat Angle, Deg.	Tappet Clearance Intake, In.	Tappet Clearance Exhaust, In.	Tappets Adjusted Hot or Cold
1	ACF-Brill C-27	Inter RD 372	6I	4 3/8	4 1/8	146	2950	6.3	116.5d	1-5-3 6-2-4	AC-43 Com	D 1112357	.026-.032	.018-.024	35	5+	—	22	—	A	400	3200	TP or WR	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018-.020	.018-.020	Hot
2	ACF-Brill C-31	Inter RD 406	6I	4 3/8	4 1/2	140	2750	6.3	120d	1-5-3 6-2-4	AC-43 Com AL ANS CH J6	D 1112357	.026-.032	.018-.024	35	5+	—	22	—	A	400	3200	TP or WR	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018-.020	.018-.020	Hot
3	ACF-Brill SU-37	Inter RD 450	6I	4 3/8	5	162	2800	6.2	122.5d	1-5-3 6-2-4	AC-43 Com AL-ANS CH-J6	D 1112357	.026-.032	.018-.024	35	5+	—	22	—	A	400	3200	TP or WR	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018-.020	.018-.020	Hot
4	ACF-Brill C44	Hall-Scott-180-1	6I	5	6	208	2200	6.	116	1-5-3 6-2-4	CH-6	D-4144	.025	.024	37	10+	30	22	15	A	400	1400	HS	3140	AESW	2 5/8	.4965	30	2 3/8	.5275	45	.022	.022	Cold
5	ACF-Brill IC-41A	Hall-Scott-190-2	6I	5 1/4	6	220	2200	5.6	114	1-5-3 6-2-4	CH-6	D-4144	.025	.024	37	10+	30	22	15	A	400	1400	HS	3140	AESW	2 5/8	.4965	30	2 3/8	.5275	45	.022	.022	Cold
6	Beaver B-25-PT, B-31-PT	International Red 361	6I	4 1/8	4 1/2	126	2700	6.3	100	1-5-3 6-2-4	AC-43 Com	D- 1110167	.028-.032	.018-.024	35	11+	—	22	•	V	500	1800	TP	3140	SII	2 1/4	.437	45	1 5/8	.437	45	.015	.018	Hot
7	Beaver B-35-PT	International Red 450	6I	4 3/8	5	148	2400	6.3	110.6	1-5-3 6-2-4	AC-43 Com	D- 1110167	.028-.032	.018-.024	35	TDC	—	22	•	V	500	1800	TP	3140	SII	2 1/4	.437	45	1 5/8	.437	45	.015	.018	Hot
8	Beaver B-29PT	International Blue Diamond 268	6I	3 9/16	4 1/2	108.5	3000	6.3	114.6	1-5-3 6-2-4	AC-43 Com	D- 1110118	.028-.032	.018-.024	35	3+	—	28	—	A	600	3000	TP	.....	.....	.....	.342	45	.....	.342	45	.018	.018	Hot
9	Beck Silverliner	Cummins NHB-600	6I	5 1/4	6	300	2100	15.5	500-525	1-5-3 6-2-4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	TP	S	S	1 3/4	.493	30	1 3/4	.493	30	.014	.027	Hot
10	Beck Luxury Liner	Continental R-6536	6I	4 13/16	5 3/8	200	2600	6	120-150	1-5-3 6-2-4	Ch-5 Com	D- 1112253	.030	.018-.024	—	5+	—	36	—	A	500	3000	TP	SII	TP Alloy	2 1/8	.....	30	1 15/16	.....	44	.020	.020	Hot
11	Beck Super Steeliner	International Red 361	6I	4 1/8	4 1/2	126	3000	6.3	110-160	1-5-3 6-2-4	AC-43	D- 1110167	.028-.032	.018-.024	—	4+	—	26	—	A	500	3000	TP	3140	XCR	2 1/4	.372	15	1 5/8	.437	44	.020	.....	.08 18-C 20-H
12	Beck-29	Cummins JBS-600	6I	4 1/8	5	150	2500	600	500 15.5	1-5-3 6-2-4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	TP	S	S	1.53	.493	30	1.53	.493	30	.015	.025	Oil Tem 140°F
13	Beck "5000" Mainliner	Inter. RD-450	6I	4 3/8	5	162	2800	6.2	1225	1-5-3 6-2-4	CH J6	D- 1112257	.032	.018-.024	85	5+	—	22	—	A	400	3200	TP	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018-.020	.018-.020	Hot
14	Chevrolet 3802, 4502	Own T/Master	6I	3 1/2	3 3/4	92	3400	6.6	110	1-5-3 6-2-4	AC-44 5 Com	D- 1112362	.035	.018	34	5 BTC	—	36	28	VA	600	3400	Chev	SII	SII	1 41/64	.3413	30	1 1/2	.3484	45	.008	.015	Hot
15	Chevrolet 6702	Own L/Master	6I	3 9/16	3 15/16	105	3600	6.7	110	1-5-3 6-2-4	AC-44 5 Com	D- 1112363	.035	.018	34	5 BTC	—	31	28	VA	600	3700	Chev	SII	SII	1 15/16	.3413	30	1 1/2	.3484	45	.008	.015	Hot
16	CUB Coach 16-S "B" Series	Ford 9 H-J	6I	3.300	4.400	95	3300	6.8:1	110	1-5-3 6-2-4	Ch-H9	Ford	.025-.028	.024-.026	—	TDC	—	—	22	VA	400	2600	Ford	SII	Ford	1.65	.341	45	1.52	.341	45	.011	.015	Cold
17	CUB Coach 21-T "B" Series	Ford 9 H-J	6L	3.300	4.400	95	3300	6.8:1	110	1-5-3 6-2-4	Ch-H9 AL	Ford AL	.028-.025	.026-.024	—	TDC	—	—	22	VA	400	2600	Ford	SII	Ford SII	1.65 1/32	.341 .3405	45	1.52	.341 .3395	45	.011	.015	Cold
18	Dodge B-3-FS, B-3GS	TS-314, TXS-314	6L	3 7/16	4 1/4	109	3600	.....	6.6	1-5-3 6-2-4	AR5A AL	IAY-4004 AL	.035	.020	38-40	TDC	—	24	—	A	700	3050	TP	SII #1	#CR SII	12 3/32	.3415 .3405	45	1 1/2	.3405 .3395	45	.010	.014	Cold
19	Dodge B-3-HHS	TS-316	6L	3 7/16	4 1/4	109	3600	.....	6.6	1-5-3 6-2-4	AR5A AL	IAY-4004-1 AL	.035	.020	38-40	TDC	—	24	—	A	700	3050	TP	SII #1	#CR SII	1 23/32	.3415 .3405	45	1 1/2	.3405 .3395	45	.010	.014	Cold
20	Dodge B-3-JS	TS-318	6L	3 7/16	4 1/2	114	3600	.....	6.6	1-5-3 6-2-4	AR5A AL	IAY-4004-1 AL	.035	.020	38-40	TDC	—	24	—	A	700	3050	TP	SII #1	#CR SII	1 23/32	.3485	45	1 1/2	.43	45	.010	.018	Cold
21	Dodge B-3-RS	TS-320	6L	3 3/4	4 5/8	122	3200	.....	6.4	1-5-3 6-2-4	AR5A AL	IAY-4103-1 D	.035	.020	38-40	TDC	—	22	—	A	700	2400	TP	SII #1	#CR	1 15/16	.3705	45	1 3/4	.4335	45	.010	.018	Cold
22	Fitzjohn 310 & FTG Cityliner & 510 Duraliner	Herc. JXLD	6L	4	4 1/2	131	3000	125A	6.2	1-5-3 6-2-4	TTY	1110200	.025	.018	35	TDC	—	22	—	A	400	3000	E	AS	AS	1 7/8	.373	30	1 25/32	.373	30	.012	.014	Cold
23	Fitzjohn FTG Cityliner	HERC. WXLD	6L	4 1/4	4 3/4	140	2600	125A	6.2	1-5-3 6-2-4	CH J-6	1110200	.025	.018	35	TDC	—	22	—	A	400	2600	E	AS	AS	1 7/8	.373	30	1 25/32	.373	30	.012	.016	Cold
24	Fitzjohn FTD Cityliner	HERC. DWXLD	6L	4 1/4	5	142	2600	.....	15.5	1-5-3 6-2-4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E	S1	S1	2 1/8	.437	30	1 5/8	.437	30	.016	.016	Cold
25	Fitzjohn 635 Super Duraliner	WAUK. 140GK	6I	4 1/2	5 1/2	176	2600	90B	6.2	1-5-3 6-2-4	CH H-9	O 1111775 Delco	.025	.018-.024	35	TDC	—	30	—	A	500	2500	TP	S2	S2	2 1/8	4355 .3715	30	1 9/16	.4345 .3711	45	.014	.026	Cold
26	Flexible 37B1, 29B1, 25B1, 21B1	FB 320	8I	37/16	4 5/16	144	3600	6.1	110	1-5-3 8-3-7-4	AC-48	Flexible Delco	.040	.018	31	6+	—	26	18	AC	500	3000	TR	CN	SII	1 25/32	.3725	45	1 7/16	.3719	45	.019	.019	Hot
27	Flexible 21BB 1-50	Fit-320	8I	3 7/16	4 5/16	144	3600	6.1	110	1-5-3 8-3-7-4	AC-46X	Flexible Delco	.04	.018	31	6+	—	26	18	AC	500	3000	TR	CN	SII	1 25/32	.3725	45	1 7/16	.3719	45	.019	.019	Hot
28	Flexible 218DWX1-51, 238DWX1-51	Hercules DWXLD	6I	4 1/4	5	142	2600	15	.....	1-5-3 6-2-4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E	S	S	1 5/8	.435	45	2 1/8	.435	45	.016	.016	Cold
29	Gen. Amer. Aerocoach 372 MH	Intinarv. RED-30 Continental	6I	4 3/8	5	148	2900	6.3	115	1-5-3 6-2-4	Com. AC-43	D- 1110167	.025	.020	35	0°	—	26	—	—	500	2600	TP	3140	SII	2.25	.372	15	1.62	.437	45	.018	.018	Hot
30	Gen. Amer. Aerocoach T-361	U6501 Hercules	6I	4 1/2	5 1/4	170	2400	6.4	125 750	1-4-2 6-3-5 1-4-2	Com. AC-82	D- 1112261	.025	.020	35	5°	—	30	—	—	500	2400	TP	SII	BRSF	2.14	.435	30	1.87	.432	44	.020	.024	Hot
31	Gen. Amer. Aerocoach T-361	DRXCC Continental	6I	4 5/8	5 1/4	147	2200	15	110 120	6-3-5 1-5-3	..... Ch-5	.....	.....	.....	.....	10°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
32	GGen. Amer. Aerocoach T-451	R-6572	6I	4 3/4	5 3/8	210	2500	6.7	110	6-2-4 1-5-3	Com Com	..... D-	.025	.020	—	B-06	—	—	—	A	—	—	TP	SII	BRSF	2 9/64	.497	30	1 57/64	.493	44	.020	.020	Hot
33	Gen. Amer. Aerocoach 373	Continental U6501	6I	4 1/2	5 1/4	170	2400	6.14	120	6-2-4	AC-82	1112265	.025	.020	35	5°	—	30	—	C	500	2400	TP	SII	BRSF	2.14	.435	30	1.87	.432	44	.020	.024	Hot

Tappet Clearance Intake, In.	Tappet Clearance Exhaust, In.	Tappets Adjusted Hot or Cold	PISTONS: Type Piston Material	No. Compression Rings	No. Oil Rings	Width Comp. Ring, In.	Width Oil Ring, In.	FUEL SYSTEM: Carburetor Make and Model	Carburetor Size, In.	Up or Downdraft	Single or Dual Carburetor	Float Level (No. 3)	How is Float Level Measured (No. 4)	Choke Control-Auto or Manual	Make Choke	Make and Model Antipassing Device	Make and Model Fuel Pump	Testing Pump on Engine: Pump Static Pressure Lb. Sq. in. (x)	Testing Pump on Engine: Min. Bleed Pt. per min. (y)	Pump Delivery in Pints – Fuel per Minute	Make and Model Engine – Heat Control Device	Water Capacity Entire Cooling System, Gal. Less Heaters & Pipes	Oil Capacity Crankcase, Qts.	Recommended S.A.E. Oil Viscosity, Summer	Recommended S.A.E. Oil Viscosity, Winter	Normal Oil Pressure, Lb.	At What Engine R.P.M.?	Oil Filter Make and Type	
.018-.020	.018-.020	Hot	Al	3	1	.0932-.1237	.1865	H-AA-IG	1 1/4 Duplex Special	D	S	1 1/4 H	G	Man	H	NS	AC GP 7919	4-5 1/4	...	2.67	D	8	10-1/2	40-50	30	40-50	1500	D-Cartridge	1
.018-.020	.018-.020	Hot	Al	3	1	.0932-.1237	.1565	H-852-FFG	1 1/4 Duplex	D	S	1.340 H	G	Man	H	NS	AC GP 7919	4-5 1/4	...	2.67	D	8	10-1/2	40-50	30	40-50	1500	D Cartridge	2
.018-.020	.018-.020	Hot	Al	3	1	.0932-.1237	.1865	H-852-FFG	1 1/4 Duplex	D	S	1.340 H	G	Man	H	NS	AC 1539513	4-5 1/4	...	2.67	D	8	10-1/2	40-50	30	40-45	1500	D Cartridge	3
.022	.022	Cold	Al	1	3	3/32	1/4 1/8+	Zen-63 AW 16	2	Up	S	2 1/64-B	G	Auto	Sis	NS	Car P4035	.....	...	2 3/4-4	K	20	28	30-40	30	80	2200	Win	4
.022	.022	Cold	Al	1	3	5/32	1/4 1/8+	Zen-63 AW 16	2	Up	S	1 3/64-B	G	Auto	Sis	NS	AP	2	...	2 2/3-4	K	20	28	30-40	30	80	2200	Win	5
.015	.018	Hot	Al	3	1	.124	.186	Zen-23 AV 12	1 1/2	D	S	25/32-B	G	Auto	Ben	NS	AC 1537041	3-4	...	4	K	11	10	50	30	40	1600	M	6
.015	.018	Hot	Al	3	1	.124	.186	Zen-63 AW 14	1 3/4	Up	S	25-32-B	G	Auto	Ben	NS	AC 1537041	3-4	...	4	K	11	10	50.	50 10W-	40	1600	M	7
.018	.018	Hot	Al	3	1	1/8 .1500	3/16 .2440	Zen-30 BW 11	1 3/8	D	S	5/8-B	G	Man	EC	NS	AC 1537365	3	1	....	D	20.7	7 1/4	40-50	30	40-45	1800	M	8
.014	.027	Hot	Al	3	1	.1505	.2445	.....	.....	...	...	..... Closed	...	....	....	...	Ca	.....	...	....	...	8	28	30	30	35-50	2300	H	9
.020 .018	.020	Hot 18-C 20-H	Al	4	1	.186	.248	Hol-BBS-JJSG	2	D	S	15/16-D	G	Man	EC	NS	AP	.....	...	....	TH	.....	16	40	30	50	2900	M	10
.020	.....	Oil Temp. 140°F.	Al	3	1	.1285	.186 .2440	Hol-AA1G	1 1/2	D	S	D	G	Man	EC	NS	AP AC	.....	...	....	TH	.....	10	40-50	30	40-45	2700	M	11
.015 .018	.025 .018		AL	3	1	L .0932	.2445	.....	.....	...	...	.....	...	....	....	...	.....	.....	...	....	TH	7	12	30	10	30-50	2500	M	12
.020	.020	Hot	AL	3	1	.1237	.1865	H-852-FFG	.....	D	S	1.340-H	G	Man	RP	NS	AC	4-5 1/4	1	....	D	7	10	40 20 or	20	40-45	1500	M	13
.008	.015	Hot	CIA	2	1	1/8	3/16	RP-7002050	1 1/4	D	S	K	G	Man	....	...	AC-AF	3-4	...	....	Th	15 qt.	5	20W	10W	14	2900	AC	14
.008	.015	Hot	CIA		1	M	3/16	RP-7002051	1 1/2	D	S	K	G	Man	....	...	AC-AF	3-4	...	....	Th	17 qt.	5	20 or 20W	10W	14	2900	AC	15
.011	.015	Cold	Al	2	2	.093	.186	Ford	1.5	Up	S	5/8B	J	M	....	NS	F	4-5	...	4	Cad	4 1/2	5	30	20	50	2900	Ford	16
.011	.015	Cold	Al	2	2	.093	.186	Ford	1.5	Up	S	5/8B	J	M	....	NS	F	4-5	...	4	Cad	4 1/2	5	30	20	50	2900	Ford	17
.010	.014	Cold	AL	2	2	3/32	5/32	BB E7T1	1 1/2	D	S	5/64B	G	M	Own	...	AC-1539543	4-5	...	2.83	....	19 1/4	5	....	....	40	800	....	18
.010	.014	Cold	AL	2	2	3/32	5/32	BB E7T1	1 1/2	D	S	5/64B	G	M	Own	...	AC-1539543	4-5	...	2.83	....	19 1/4	6	....	....	40	800	P-W 1/2	19
.010	.018	Cold	AL	2	2	.093	.150	BB E7T1	1 1/2	D	S	5/64B	G	M	Own	...	AC-1539543	4-5	...	2.83	....	21 1/2	6	....	....	40	800	P-W 1/2	20
.010	.018	Cold	AL	3	1	.093 3/32	.24	BB E7T1	1 1/2	D	S	5/64B	G	M	Own	...	AC-1539289	4-5	...	3.0	....	30 1/4	9	....	....	45-55	1000	P-W 1/2	21
.012	.014	Cam	AL	2	2	1/8 3/32	3/16	Z-63AW14	1 3/4	Up	S	1 3/64B	G	Man	Am	NS	AC-1539420	3 1/2	...	....	K	.....	9	30	20	26	1400	M	22
.012	.016	Cold	AL	2	2	1/8	1/4	Z-29W14	1 3/4	D	S	15/16C	G	Man	S	NS	SW-1100	3 1/2	...	....	K	.....	10	30	30	26	1600	M	23
.016	.016	Cold	AL	3	2	1/8	3/16	.....	.....	...	...	.....	...	....	....	...	805	.....	...	....	K	.....	14	30	20	40	1800	H	24
.014	.026	Cold	AL	3	2	1/8	3/16	Z-63AW14	1 3/4	Up	S	1 32/64C	G	Man	Am	NS	AC-1001128	3 1/2	...	....	K	.....	15	40 20W-	40 20W-	40	2200	M	25
.019	.019	Hot	Al	2	2	3/32	3/16	Str-AAV-26	1 1/4	D	D	19/32-F	R	Auto	Str	NS	AP	2	1	2 3/4	K	13	13	SAE 20W-	10W 20W-	45	2400	D	26
.019	.019	Hot	Al	2	2	3/32	3/16	Str-AAV-26	1 1/4	D	D	19/32-F	R	Auto	Str	NS	AP	2	1	2 3/4	K	7 1/4	13	SAE30	10W	45	2400	AC P	27
.016	.016	Cold	AL	3	2	1/8	3/16	.....	.....	...	...	.....	...	....	....	NS	BOS	.....	...	....	...	9 3/4	15	30	30	45	1600	B-901	28
.018	.018	Hot	AL	3	1	1/8	3/16	Zen-29W-14	1 3/4	D	S	1 5/16	..	M	Sis	NS	Car	3-4	...	....	K	22	9	50	40	50	2400	D	29
.020	.024	Hot	Al	3	2	3/32	1/4	Zen-29-16	2	D	S	1 41/64	..	M	....	NS	Car	3-4	...	....	K	21	12	30	30	50	2400	F	30
.....	.....	...	Al	..	..	.....	.....	.....	.....	...	...	.....	...	....	....	NS	.....	3	...	....	K	21	14	30	30	50	2400	P	31
.020	.020	Hot	Al	3	2	3/32	7/16+	Zen-29W-14	1 3/4	D	...	.....	...	Man	....	...	Car P4035	3-4	...	3	K	21	14	40	30	40-60	2500	F	32
.020	.024	Hot	Al	3	2	3/32	1/4	Zen-29-D13	1 5/8D	D	D	1 41/64	...	M	Sis	NS	Car	3-4	...	....	K	22	12	30	30	50	2400	F	33

Spark Plug Make
AC – AC Spark Plug
AL – Auto-Lite
Ch – Champion

Electrical Equipment Make
AL – Auto-Lite
D – Delco Remy

Valve Make
Chev – Chevrolet
E – Eaton
HS – Hall Scott
R-W – Rich Mfg. or WR
TP – Thompson Products
WR – Wilcox-Rich

Choke Make
Am – American Chain
Ben – Bendix
Car – Carter
EC – Electric Controlled
H – Holley
L-N – Leece-Neville
Pir – Pierce Governor
R-P – Ringwald Prod.
Sis – Sisson
Str – Stromberg
S – Solenoid

Cylinder Head Type
I – Valve-in-head
L – Valve-in-block

Carburetor Make
BB – Ball & Ball
Car – Carter
E – Ensign
H – Holley
HP – Rochester Products
Str – Stromberg
Zen – Zenith

Engine Heat Control
AS – Automatic Shutter
BB – Bishop & Babcock Thermostat
Cad – Cadillac
D – Dole Thermostat
F – Fulton Thermostat
K – Kysor Shutter
Th – Thermostat

Degasser Make
Fa – Fageol
NS – Not Standard

Fuel Pump Make
AC – AC Spark Plug
AP – Autopulse
Bos – Bosch
Car – Carter
Cu – Cummins
En – Ensign Regulator
SW – Stewart-Warner
F – Electric Pump in Bottom of Fuel Tank

Oil Filter Make
AC – AC Spark Plug
AM – Air Maze
D – DeLuxe
F – Fram
H – Hercules
M – Michiana
N – Nugent
P – Purolator
W – W.G.S.
Win – Winslow

NOTES:

1 – Compression Pressure
a – at 1,000 R.P.M.
b – at 125 R.P.M.
c – at 250 R.P.M.
d – at 150 R.P.M.
f – at 400 R.P.M.

2 – Timing
- Before Top Dead Center

3 – Float Level
B – Below Edge of Bowl
C – Below Finished Surface of Cover
D – Gasket Surface to Edge of Float Gasket
F – Top of Chamber to Float Level
G – Downdraft – 5/8-in. Top of Chamber to Float Level bottom of sight hold. Updraft 7/8 in. Below Top Face of Float Chamber.
H – 1 1/4 Flange Surface to Bottom of Float
K – 1 5/16 Bottom of Float to Cover finished Surface

4 – Carburetor Float Level
G – Gage
R – Engine Running
J – Bottom of Anhorn to Bottom of Float. Open and Closed Position.

TYPE ADVANCE
A – AUTOMATIC
VA – VACUUM ACTUATED
C – CENTRIFUGAL
AC – AUTOMATIC CENTRIFUGAL

(x) – This is "dead end" test from pump outlet to gage – engine operated at idle on fuel in carburetor.

(y) – Bleed from tee in pump to carburetor line – engine at idle.

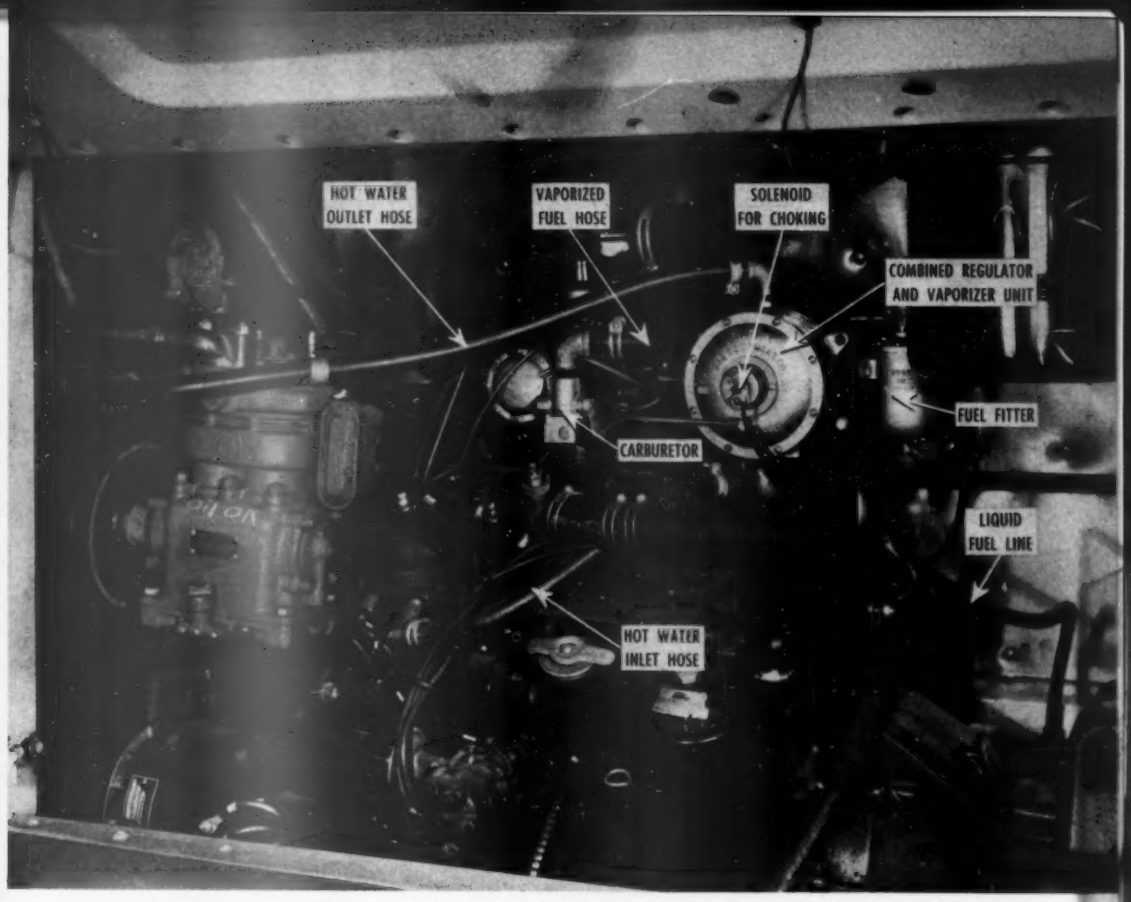
Compression Ring:
L – Wedge type One top $\frac{.1175}{.1187}$, Two Ctr. $\frac{.1190}{.1195}$
M – Twist type One 1/8" and one 3/32"

Materials
Al – Aluminum
AS – Austinetic Steel
BRFS – Brt. Roy Coated Stellite Faced
CI – Cast Iron
CIA – Cast Iron Alloy
CM – Carton Molybdenum
CY – Chrome Nickel
CS – Cast Steel
ES – Extruded Steel
HCS – High Chrome Steel
MI – Malleable Iron
Mol – Molybdenum
Nif – Nifemite
V – Nichol
S1 – SAE #2112
S2 – SAE #2112 Heads & SAE #3140 Stems
SCM – Silicon Chrome Molybdenum
Sil – Silchrome
SS – Stellite
S – Steel Not Otherwise Specified
Sta – Stabl-ite
Tun – Tungsten

ENGINE TUNE-UP SPECIFICATIONS—1951

	Bus Make and Model	Engine Make and Model	No. Cylinders – Cylinder Head Type	Bore, In.	Stroke, In.	Maximum Horsepower	At What R.P.M. is Max. H.P. developed?	Compression Ratio	Compression Pressure at Starter Speed, Lb. sq. in. (Note 1)	Engine Firing Order	IGNITION									
											Spark Plug and Number	Distributor Make and Number	Spark Plug Gap, In.	Breaker Gap, In.	Cam Angle, Deg.	Engine Timing, Deg. (Note 2)	Distributor Advance-Deg.			Type Advance
																	Manual	Centrifugal	Vacuum	
1	ACF-Brill C-27	Inter RD 372	6I	4 3/8	4 1/8	140	2850	6.3	116.5d	1-5-3 6-2-4	AC-43 Com AL ANS CH J6	D 1112357	.028-.032	.018-.024	35	5+	...	22	..	A
2	ACF-Brill C-31	Inter RD 406	6I	4 3/8	4 1/2	149	2750	6.3	120d	1-5-3 6-2-4	AC-43 Com AL ANS CH J6	D 1112357	.028-.032	.018-.024	35	5+	...	22	..	A
3	ACF-Brill SU-37	Inter RD 450	6I	4 3/8	5	162	2800	6.2	122.5d	1-5-3 6-2-4	AC-43 Com AL-ANS CH-J6	D 1112357	.028-.032	.018-.024	35	5+	...	22	..	A
4	ACF-Brill CA4	Hall-Scott-185-1	6I	5	6	298	2200	6.	116	1-5-3 6-2-4	CH-6	D-4144	.025	.024	37	10+	30	22	15	A
5	ACF-Brill IC-41A	Hall-Scott-190-2	6I	5 1/4	6	220	2200	5.6	114	1-5-3 6-2-4	CH-6	D-4144	.025	.024	37	10+	30	22	.15	A
6	Beaver B-25-PT, B-31-PT	International Red 361	6I	4 1/8	4 1/2	126	2700	6.3	100	1-5-3 6-2-4	AC-43 Com	D- 1110167	.028- .032	.018- .024	35	11+	...	22	•	V
7	Beaver B-35-PT	International Red 450	6I	4 3/8	5	148	2400	6.3	110.6	1-5-3 6-2-4	AC-43 Com	D- 1110167	.028- .032	.018- .024	35	TDC	...	22	•	V
8	Beaver B-25PT	International Blue Diamond 298	6I	3 9/16	4 1/2	100.5	3000	6.3	114.6	1-5-3 6-2-4	AC-43 Com	D- 1110118	.028- .032	.018- .024	35	3+	...	28	..	A
9	Beck Silverliner	Cummins NHB-600	6I	5 1/4	6	200	2100	15.5	500-525	1-5-3 6-2-4	.....	.....	.....	.....	...	.....	...	...	...	...
10	Beck Luxury Liner	Continental R-6536	6I	4 13/16	5 3/8	200	2600	6	120-150	1-5-3 6-2-4	Ch-5 Com	D- 1112253	.030	.018- .024	...	5+	...	36	..	A
11	Beck Super Steeliner	International Red 361	6I	4 1/8	4 1/2	126	3000	6.3	110-160	1-5-3 6-2-4	AC-43	D- 1110167	.028- .032	.018- .024	...	4+	...	26	..	A
12	Beck-175	Cummins JBS-600	6I	4 1/8	5	150	2500	600	15.5	1-5-3 6-2-4	.....	.....	.....	.....	...	.....	...	...	...	...
13	Beck "5000" Mainliner	Inter. RD-450	6I	4 3/8	5	162	2800	6.2	1225	1-5-3 6-2-4	CH J6	D- 1112357	.028 .032	.018 .024	85	5+	...	22	...	A
14	Chevrolet 3802, 4302	Own T/Master	6I	3 1/2	3 3/4	92	3400	6.6	110	1-5-3 6-2-4	AC-44 5 Com	D- 1112362	.035	.018	34	5 BTC	...	36	28	VA
15	Chevrolet 6702	Own L/Master	6I	3 9/16	3 15/16	105	3600	6.7	110	1-5-3 6-2-4	AC-44 5 Com	D- 1112363	.035	.018	34	5 BTC	...	31	20	VA
16	CUB Coach 16-S "B" Series	Ford 9 H-J	6I	3.300	4.400	95	3300	6.8:1	110	1-5-3 6-2-4	Ch-H9	Ford	.025 .028	.024 .026	...	TDC	...	...	22	VA
17	CUB Coach 21-T "B" Series	Ford 9 H-J	6L	3.300	4.400	95	3300	6.8:1	110	1-5-3 6-2-4	Ch-H9	Ford	.025- .028	.024- .026	...	TDC	...	...	22	VA
18	Dodge B-3-FS, B-3GS	TS-314, TXS-314	6L	3 7/16	4 1/4	109	3600	.....	6.6	1-5-3 6-2-4	AL AR5A	AL IAY4004	.035	.020	38-40	TDC	...	24	...	A
19	Dodge B-3-HNS	TS-316	6L	3 7/16	4 1/4	109	3600	.....	6.6	1-5-3 6-2-4	AL AR5A	AL IAY4004-1	.035	.020	38-40	TDC	...	24	...	A
20	Dodge B-3-JS	TS-318	6L	3 7/16	4 1/2	114	3600	.....	6.6	1-5-3 6-2-4	AL AR5A	AL IAY4004-1	.035	.020	38-40	TDC	...	24	...	A
21	Dodge B-3-RS	TS-320	6L	3 3/4	4 5/8	122	3200	.....	6.4	1-5-3 6-2-4	AL AR5A	AL IAY4103-1	.035	.020	38-40	TDC	...	22	...	A
22	Fitzjohn 310 & FTG Cityliner & 510 Duraliner	Herc. JXLD	6L	4	4 1/2	131	3000	125A	6.2	1-5-3 6-2-4	AL TTY	D 1110200	.025	.018	35	TDC	...	22	...	A
23	Fitzjohn FTG Cityliner	HERC. WXLD	6L	4 1/4	4 3/4	140	2600	125A	6.2	1-5-3 6-2-4	CH J-6	1110200	.025	.018	35	TDC	...	22	...	A
24	Fitzjohn FTD Cityliner	HERC. DWXLD	6L	4 1/4	5	142	2600	.....	15.5	1-5-3 6-2-4	.....	.....	.....	.....	...	.....	...	...	...	...
25	Fitzjohn 625 Super Duraliner	WAUK. 140GK	6I	4 1/2	5 1/2	176	2600	90B	6.2	1-5-3 6-2-4	CH H-9	O 1111775	.025	.018 .024	35	TDC	...	30	...	A
26	Flexible 37B1, 29B1, 25B1, 21B1	FTI 320	8I	37/16	4 5/16	144	3600	6.1	110	1-5-3 8-3-7-4	AC-48	Delco Flexible	.040	.018	31	6+	...	26	18	AC
27	Flexible 21B3 I-50	Fti-320	8I	3 7/16	4 5/16	144	3600	6.1	110	1-5-3 8-3-7-4	AC-46X	Delco Flexible	.04	.018	31	6+	...	26	18	AC
28	Flexible 218DWX1-51, 218DWX7-51	Hercules DWXLD	6I	4 1/4	5	142	2600	15	.....	1-5-3 6-2-4	.....	.....	.....	.....	...	.....	...	...	...	...
29	Gen. Amer. Aerocoach 372 MH	Intimarv. RED-50	6I	4 3/8	5	148	2600	6.3	115	1-5-3 6-2-4	Com. AC-43	D- 1110167	.025	.020	35	0°	...	26	..	...
30	Gen. Amer. Aerocoach T-361	Continental U6501	6I	4 1/2	5 1/4	170	2400	6.4	125	1-4-2 6-3-5	Com. AC-82	D- 1112261	.025	.020	35	5°	...	30	..	...
31	Gen. Amer. Aerocoach T-361	Hercules DRXCC	6I	4 5/8	5 1/4	147	2200	15	750 110	1-4-2 6-3-5	.....	.....	.....	.....	...	.....	...	...	...	...
32	GGen. Amer. Aerocoach T-451	Continental R-6572	6I	4 3/4	5 3/8	210	2500	6.7	120 110	1-5-3 6-2-4	Ch-5 Com	...	.025	.020	...	10° B-06	...	...	..	A
33	Gen. Amer. Aerocoach 373	Continental U6501	6I	4 1/2	5 1/4	170	2400	6.14	120	1-5-3 6-2-4	Com AC-82	D- 1112265	.025	.020	35	5°	...	30	..	C

BUS TRANSPORTATION



PROPANE CARBURETOR operation is almost the same as that of gasoline system. Every propane carburetor has a means of giving a lean, cruising mixture and a rich power mixture. Most makes have separate adjustments for the two mixture ranges.

How The Propane Fuel System Operates

By Carl Abell

● YES, THE PROPANE fuel system does look mysterious and complex to one who is accustomed to gasoline carburetion. But that is only because the form and shape of the propane units are unfamiliar.

The two systems are different in mechanical details because they must control fuels of two very different boiling ranges. But a step by step analysis of the function of the units in the two systems reveals a remarkable similarity. This similarity of functions is neither accidental nor the result of imitation; it is necessary. This is because the requirements of the engine remain the same, whether it is operating on gasoline or propane.

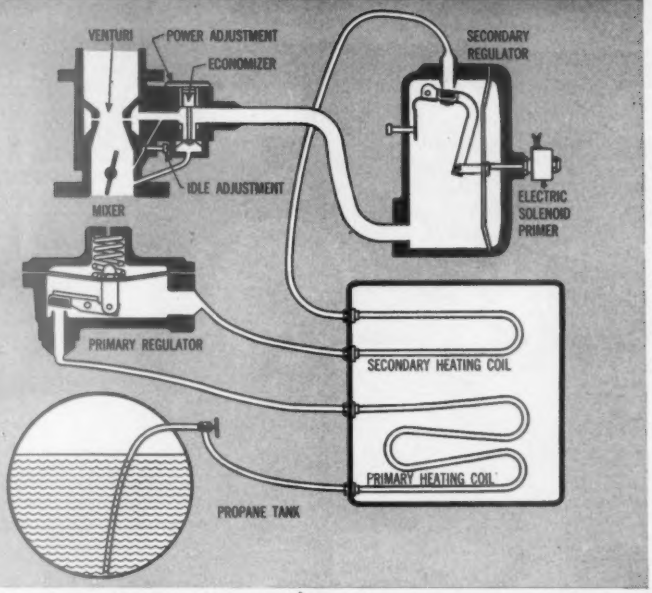
For full power the engine must have a mixture which is slightly richer than that which would give complete combustion if given unlimited time. For economy during part throttle operation, it does its best on a mixture that is very little below "complete combustion." For smooth idling and uninterrupted transfer from the idle circuit to the main fuel supply, it must have a definite degree of richness in the mixture.

Slight Differences in Systems

Since these are the requirements of the engine, the mechanism and adjustments of the fuel system must be designed to bring the right amount of fuel to the point of delivery in the "mixer" at the atmospheric pressure which exists in the airstream just ahead of the carburetor throat. The moving air then draws its own proportionate supply of fuel to meet the operating needs of the moment, and delivers the fuel mixture, more or less

BUS TRANSPORTATION
Maintenance Mobili tion Issue
1951

THE PROPANE FUEL SYSTEM



IN PROPANE SYSTEM vaporization takes place at outlet of primary regulator, where heat must be applied to offset refrigeration. This is done by hot water from engine cooling.

adequately prepared for combustion, to the several cylinders.

In either case we start with liquid fuel at the tank, and end up with a prepared mixture of fuel and air at the inlet valve. The only differences in the two fuel systems are those which are necessary because at atmospheric pressure gasoline is a liquid and propane is a vapor. Now let us start at the fuel tanks and analyze the two systems step by step, using the accompanying diagram as a guide.

Propane Tank Must Be Strong

The gasoline tank is simply "gravity storage" for the liquid. Force must be provided to move the gasoline to the point of use, and for this purpose we provide a liquid pump. As the fuel is withdrawn, it is replaced by air, which enters through a vent so there will be no vacuum to interfere with pumping.

The liquid propane, which has a boiling point of 44 degrees below zero, tends to expand into a vapor, and develops quite a pressure because it is forced to remain compressed into liquid form. The propane tank must therefore be heavy and strong, and must be sealed to prevent the escape of the fuel.

As withdrawal takes place, propane vapor fills the space above the liquid level. The propane does its own pumping, because of its high internal pressure, which amounts to between 80 and 100 pounds per square inch at a temperature of 65 degrees. At higher or lower temperatures the pressure is proportionately greater or less, but there is always plenty of pressure to move the fuel out of the tank as it is used in the carburetor.

Both the gasoline pump and the internal pressure of the propane are capable of delivering a great deal more fuel than the engine requires, and at a much higher pressure. The fuel must eventually be presented at the carburetor orifices under a pressure which is maintained as nearly as possible at atmospheric.

It is not practical to build a single stage regulating device which will provide such close tolerances of outlet pressure against either a high initial pressure or a widely varying pressure on the inlet side. In both fuel systems we therefore incorporate two stages of pressure regulation, the first or primary regulator to reduce the fuel pressure to a nearly constant low value, and the second, sometimes called the secondary or the atmospheric regulator, to drop the nearly constant low pressure to zero pressure at the carburetor orifices.

You have never seen these two pressure regulators in the gasoline system? Look again. The first regulator is basically a flexible diaphragm working against a coil spring, just as it is in the propane system. This diaphragm is incorporated in the fuel pump in such a way that it not only pumps the gasoline, but also controls the outlet pressure to a steady value of some figure between two and 10 pounds per square inch. It is generally in the lower part of this range.

The corresponding diaphragm-actuated regulator in the propane system operates the shut-off valve in the fuel line in such a way that liquid is admitted from the tank only fast enough to replace the gas which flows out through the carburetor. This propane regulator likewise maintains a pressure on its outlet side of a nearly constant value somewhere between two and 10 pounds per square inch.

Propane Vaporized As It Leaves

Both of these diaphragm type pressure reducers operate on the same principle as the familiar reducing valves on oxygen cylinders, except that in the engine fuel systems the valves are not adjustable.

As indicated above, the reduction of the fuel pressure to atmospheric is accomplished by a second regulator. In the gasoline system this takes place in the carburetor float bowl, where the buoyancy of the float is exerted as pressure to hold the needle against its seat, and the pressure from the pump tries to push the needle away from its seat. The float admits just enough liquid fuel to maintain the level in the bowl, and in the delivery tube.

The second pressure reducing regulator in the propane system is another diaphragm operated valve. It controls the flow of gas, since the propane is vaporized just as it leaves the first regulator. The diaphragm is balanced in such a manner that as vapor is withdrawn from the fuel side by the suction of the air stream passing through the carburetor, the pressure of atmosphere on the opposite side moves it forward, opening the valve at the outlet to the low pressure chamber of the first regulator. This restores the pressure in the final regulator to the equivalent of atmospheric.

Heat Offsets Refrigeration

When the liquid fuel evaporates in either system, it expands to something over 250 times its liquid volume. The area where this evaporation takes place is subject to a very pronounced refrigerating action, and the effects of this great temperature drop must be offset by heat. In the gasoline system, the evaporation takes

place in the manifold after the fuel is fed into the air stream. Exhaust gas is diverted around the neck of the manifold, both to prevent the choking of the passage with ice from the freezing of atmospheric moisture, and to provide extra heat to facilitate the evaporation of portions of the fuel which would otherwise remain liquid.

Carburetor Operations Alike

In the propane system, vaporization takes place at the outlet of the first, or primary regulator, and it is here that we must apply the heat to offset the refrigerating effect. This is done by circulating hot water from the engine cooling system through a water jacket in the regulator case. This is variously called the vaporizer, converter, or heat exchanger, by the various equipment manufacturers.

As a matter of production economy and servicing convenience, most manufacturers of propane equipment build the primary regulator, the vaporizer, and the secondary regulator all in one unit within a common case. The fuel is vaporized and at atmospheric pressure when it leaves the secondary regulator outlet, and it passes through a large tube to the main metering orifices of the carburetor, and through a smaller tube to supply the idle inlet, which is built into the carburetor below the throttle valve.

The operation of the propane carburetor is also a direct parallel to that of the gasoline system. In all makes there are separate adjustments for idling fuel and idling speed. Every propane carburetor has a means of providing a lean cruising mixture and a rich power mixture. In most makes there are separate adjustments for these two mixture ranges, and in others the design is so worked out that a single adjustment screw makes a corresponding change in both ranges.

Manifold Separated From Exhaust

Starting a cold engine requires a combustible mixture. With gasoline, which does not vaporize readily at low temperatures, a choke is provided to increase the suction on the fuel supply and pull in an excess amount so enough of the light ends can be vaporized to produce the combustible mixture. Since propane is a vapor at starting temperatures, it is not necessary to provide an extra volume of fuel. In fact, the same degree of choking which would be necessary to start a cold gasoline engine would be disastrous with propane. The engine would not start at all. The normal running mixture is all that is required for starting, but the fuel to make it is not immediately available in the fuel tube after the engine has been standing for a little while.

Propane vapor is heavier than air, and that which is outside the last regulator valve when the engine is shut down flows out through the carburetor orifices, and is replaced by air. It would require considerable cranking to pull this amount of air through the orifices and clear the tube so a normal fuel supply would be available.

The manufacturers therefore incorporate electric primers or other means whereby a small amount of gas can be released to blow this air out of the tube and bring gas to the orifices so immediate starting is possible. Over-use of one of these devices has exactly the same effect as choking a previously warmed up gasoline engine — it makes a mixture that is too rich to burn.

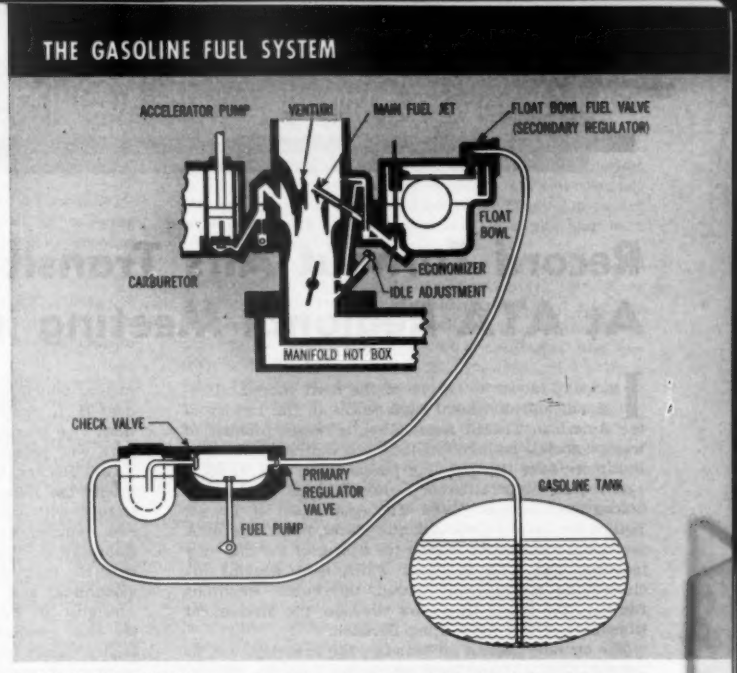
Heating of any fuel mixture after it has once been properly vaporized is neither necessary nor desirable. The manifold hot spot has never been necessary for the engine—it has only been necessary for the gasoline. It is there to vaporize the gasoline, and thus to promote equal distribution to the different cylinders. With propane, the requirements for heat have been fully met at the vaporizer, and any further heating of the fuel mixture will only result in pre-expansion, with corresponding loss of engine power. The propane manifold should therefore be completely separated from the exhaust, so it may operate as cold as possible.

Far from being complex, the propane fuel system is a step-by-step parallel to the gasoline system, except for the absence of the pump and the different location in which the heat is applied and vaporization takes place. The regulator-and-vaporizer unit is no more difficult to service or overhaul than a gasoline fuel pump, and the carburetor is far simpler, and much less likely to require attention than the complicated gasoline carburetors on the larger modern engines.

Propane System Simpler By Far

There is little that can go wrong, almost nothing that can wear out, and the metering orifices are about 250 times larger than those in the gasoline carburetor, so clogging is practically impossible.

Mechanics who have had considerable experience with both systems have come to this conclusion: the propane fuel system is by far the simpler of the two.



IN GASOLINE SYSTEM evaporation takes place in manifold after fuel is fed into air stream. Exhaust gas curls about manifold neck, providing heat to combat refrigeration effect.

Record Turnout Airs Transit Problems At ATA Regional Meeting in Baltimore

IN WHAT PROVED to be one of the most successful regional and divisional conferences in the history of the American Transit Association, a record number of transit officials gathered at the Lord Baltimore Hotel in Baltimore over the four-day period from May 21-24.

A record registration of about 450 was marked up before the meetings closed. The Association of Transit Equipment Men, Middle Atlantic States, joined the ATA divisional conferences during the course of the four-day meeting. The ATA divisions which held sessions included the Management Group, the Public Relations Division, the Small Operators' division, the Mechanical Division and the Accounting Division.

The opening session on Monday, the first day, was in the nature of a report from management on the various factors which vitally affect transit today. ATA president H. L. Bollum introduced J. M. Symington, operations vice president, Public Service Coordinated Transport, who presided at the session.

Guy Hecker, managing director of ATA, summarized briefly the Defense Mobilization Program as it affects transit, with particular emphasis on the programs for new vehicles, supplies, manpower, and wage and price stabilization. Considerable discussion was carried on from the floor with respect to recent labor contract developments and significant fare cases.

August B. Haneke, President of Baltimore Transit, the host company, discussed several of the problems facing transit today, and gave a brief summary of the program currently being carried out by his company.

Public Relations Division... "The Great Debate"

One of the features of the four-day meeting was the debate on the subject of "Does Transit Need A National Advertising Campaign to Supplement the Local Effort?" This feature, now known as "The Great Debate," was sponsored by the Public Relations Division and held jointly with the Management Conference on Monday afternoon. Speaking for the affirmative was Bruce Howat, editor, Mass Transportation; and William B. Spencer, executive assistant, United Electric Railways, Providence, R. I. Upholding the negative was Paul O. Dittmar, president, South Suburban Safeway Lines, Harvey, Illinois, and Arthur T. Warner, general manager, Public Service Coordinated Transport, Newark, N. J.

Serving as moderator was Louis J. Mathieu, Metropolitan Transit Authority of Boston. In advocating the need for a national advertising campaign, Bruce Howat pointed out that recovery, if it does come for transit, will come from "many cures," such as perfecting the ride, more equitable fares, freedom from taxation, better municipal cooperation, plus a sound, productive selling program on both the local and national levels.

"Advertising and public relations are no cure-all," Editor Howat said, "but they do present to our industry a relatively untried avenue of treatment, and they are essential to effecting any other cure.

"Advertising will sell rides if there is real service to merchandise. And this is as good a place as any to say that we don't subscribe to the theory that the transit company is selling something nobody wants. We feel that we are selling something that everybody wants even if they don't use it. And one of the reasons they don't use it is because it has been—and is—consistently undersold."

Speaker Howat emphasized that advertising will sell rides, but that ride selling must be done primarily on the local level. No company, he said, should think of sacrificing its local public relations and advertising program for any national program.

"But a continuous national public relations program is needed," he declared, "to inform legislators, build public acceptance and provide local companies with a backdrop for their own promotion work."

As the second speaker on the affirmative side of the question, Bill Spencer outlined eight significant subjects which the industry could use as the basis for a national advertising campaign. These suggested subjects are:

- Good public transit promotes business.
- Local transit helps sustain property values.
- Local transit cuts traffic congestion.
- Local transit aids community development.
- Traffic congestion hinders good transit service.
- Local transit equipment financing difficulties.
- Local transit—inadequate revenue and fares.
- Unfair local taxes.

"Time was when what is now the transit industry, but formerly known as the Street Railway Industry, made huge profits," the speaker said. "During that period the political demagogues unleashed their fury on street railway companies. The companies never made any reply. The competitive factor represented by 40 million automobiles did not exist in those days, and the street railways were making so much money they adopted an attitude of deep silence. Was this the start of the silence pattern of the present transit industry, and if so, why has it been so religiously followed?

"The transit industry must develop nation-wide mass thinking and nation-wide mass understanding of transit's problems. We must educate the masses nationally to adopt a more logical, sensible and practical method of making their short local trips by using local transit vehicles to and from city and business centers. This program must be sold at the national level so that Mr. Citizen will become informed and educated."

"Let us not be oblivious to the obvious," Paul Dittmar declared in advancing the negative position to the question under debate.

"It should be obvious," he said, "that no amount of national advertising would be successful in bringing back any product or service once it has been superceded by something superior, and once it has been forsaken by the public.

"Transit is rapidly being superceded by the automobile, and the public is forsaking transit in ever increasing numbers. To deny these facts is to be oblivious to the obvious."

Mr. Dittmar divided up the population into the lower income one-third, the middle class one-third and the top bracket one-third. He then proceeded to write off national advertising as being of little value in influencing the upper third of the population to use transit vehicles. This is the class, he said, where riding transit vehicles "is not the thing to do."

With respect to the middle third of the population, Mr. Dittmar identified them as the people who pay most of the taxes, and who can be influenced by advertising "because they are intelligent." But, he emphasized, advertising can influence them only between choices of something they already want, or can be made to want. It cannot make them want again something they have already discarded or given up.

The lower third of the population, Mr. Dittmar declared would not be influenced by a national advertising campaign, simply because they are already riders of transit vehicles. Fully two-thirds of the transit business, he said, comes from the lower third of the population.

Winding up the negative position, Arthur Warner stressed the point that a national advertising program would not reach the local level and would not help with local problems.

"The very essence of this business of providing local transportation is the local elements involved," Mr. Warner said. "Each city or community is different from its neighbor. Rates and fares are different. Equipment is different. Problems to be solved are different and demands are different. There is no such thing as a pattern to be followed, to be indorsed as something national in scope. Therefore, what would a national advertising campaign talk about?"

At the Monday morning session of the Public Relations Division, Lawrence C. Railing, supervisor of publications, Cleveland Transit, discussed the problem of "Kicking the Sacred Cows Out of Transit," placing emphasis on the all too prevalent "do-nothing" attitude of transit management with respect to customer relations, promotion and merchandising.

Bruce Howat, editor of Mass Transportation, presented the first annual awards to five transit publication editors in a contest sponsored by his magazine. The recipients were Jack Senseney, St. Louis Public Service; Chal Adams, Youngstown Municipal Railway and Akron Transportation; Roy Clark, San Antonio Transit; H. M. "Doc" Dovel, New Orleans Public Service; and George Lloyd, Philadelphia Transportation.

Small Operations Round-Table Discussion

At the Small Operations conference on Tuesday morning, a "free-swinging" round-table discussion was conducted by Leonard H. Samworth, president, Ohio Valley Bus Company, Huntington, W. Va. No formal papers were presented, and the entire time was devoted to open discussion from the floor on any and all subjects raised by the members.

Profit-sharing plans were discussed by several operators, and the one significant fact highlighted by this discussion was that most employees were still skeptical about the value of such plans, preferring to receive this potential future "take" in the present weekly paycheck.

Naturally, the subject of "Increasing Revenues" was uppermost in the minds of the members, and such problems as token rates and methods, off-peak riding, reducing auto pickups, taxicab competition, and collection methods on zone fare operations came in for considerable discussion.

August Haneke, president, Baltimore Transit, pointed out that the transit industry generally is still holding to the same pattern of fare structure and operating procedure, despite the ever-changing economy and changing times. He declared that the industry must re-define its objectives in terms of type and extent of service offered, together with its fare structure, in the light of the mass transportation needs of today's population.

J. M. Moore, Jacksonville (Fla.) Coach, discussed the free "Sunday Church Service" which his company started operating during the past year. An average of 1,200 people are transported to church each Sunday morning without charge. One direct benefit which has resulted from this service is that paid riding has increased during the rest of the day. Mr. Moore says that they cannot account for this, but simply accept it as evidence of good will resulting from the free service.

Several operators told of the success obtained from free "Shoppers Service" on the occasion of Annual Dollar Day in their communities. The service in most instances is confined to the period between 9 a.m. and 11 a.m., and in each case applies to only the "in" trip to the shopping district. The "out" trip carries the regular fare.

On the question of reducing auto pickups and taxicab competition, it was freely admitted to be a grave problem to be overcome only by a well-conceived and executed public relations program. One suggestion was that a number of these "lost riders" could be regained as the result of wide distribution of schedules.

Mechanical Division Session Sparks Lively Discussions

The Mechanical Division sponsored a spirited round-table session on Tuesday with about 80 on hand and L. A. Bode, superintendent, Automotive Shop, Baltimore Transit, in the chair. Failure of the porous chrome type top piston ring came in for considerable discussion, and many reported difficulties with it. Max Dach, superintendent of maintenance for Ohio Valley Bus, Huntington, said he had found trouble with these rings in gas engines, and was trying a special oil as remedy. He had no conclusive results as yet but was testing the theory on type 451 engines, using the same oil in each.

Al Lyons, superintendent, Rolling Stocks and Shop Department of Philadelphia Transit tossed in his ring experience with diesels and reported no trouble. This, he felt, was because the diesels are governed. In any case, he nailed the prime cause of this ring trouble as detonation. This was supported by others and it was stressed that dirt affected the problem strongly. De-

tonation, dirt, and temperature were listed as key considerations in dealing with this ring problem.

Bode kicked off another stimulating topic when he asked how and when to clean the wire mesh in engine air cleaners. This question, of course, is complicated by the fact that companies can't buy the mesh inserts. Also, because dirt situations in various cities make the problem different from place to place. However, the air cleaner problem is widespread now since more and more cars are kicking up more and more dirt all over. Generally, it was a poser and no one had any hard and fast answer to the question of how to control the accumulation of lint and fiber matter in the wire mesh. But it was suggested that steam cleaning after 4,000 miles was a good rule of thumb.

Preventive Maintenance was another topic that got a good going over. Al Lyons stressed the importance of the inspection manual to his operation, and reported that his company had an inspector who checked to see that the work was going according to the manual. Most important to maintenance procedure, he emphasized, was making the foreman conscious of the fact that they need good, well-trained help in order for them to do a job.

Supervision at Capital Transit, Washington, according to Hy Feldman, supervisor, auto maintenance, was keyed to the belief that "you need a guy to crawl on the rear end of the guy who crawls on the rear end of the guy who does the work." As an easy way to improve efficiency, he offered his company's practice of regularly issuing bulletins to mechanics and mechanics' helpers. These bulletins are packed with information of training value, and the men can fit them handily in a pocket.

Jim Wanstall, superintendent of equipment for Delaware Coach, Wilmington, made a pitch for setting up classrooms furnished with training aids. This type of instruction was always worthwhile, he said, but there was a major point to remember: emphasize what not to do, rather than what to do. It means more that way. And make courses open to anyone in the shop. It is a good morale builder when it is known that a class is open to anyone who wants to learn.

The Tuesday afternoon meeting was sponsored jointly by the Mechanical Division and the Small Operators Division, with Max Dach presiding. Proceedings got underway with the presentation of the ATA Award for industrial injury prevention. This time it went to Virginia Transit of Richmond, for operating 500,000 man-hours without loss of time through injury. In accepting the award for the company, Charlie Galloway, superintendent of equipment, pointed out that Virginia Transit actually had had but one accident in 750,000 man-hours.

Several questions were disposed of quickly, among them the decision that it is best to stick to bushings over needle bearings when used in connection with brake cams or shafts which do not make complete turns. Thinking here was that it may be hard to get needle bearings later on if materials get scarce. On changing hydraulic transmission fluid, it was decided that the 25,000-mile rule doesn't necessarily hold. Oxidation controls the reason for the change and the supplier can tell when a change is indicated by analyzing the torque converter fluid. It is quite possible to improve on that 25,000 miles if the temperature rate can be dropped.

The matter of avoiding friction between departments, when labor and parts shortages hurt maintenance standards, was handled by Max Dach. He offered the advice that everyone should be kept informed. When a bus is laid up, let the transportation department, and other interested groups, know about it at once.

The question of upping tire mileage stirred up active interest during the session. Bode got it started by mentioning such points as proper wheel alignment, correct steering geometry, equal brake application to all four wheels, and the needless wear-and-tear caused by getting behind on schedules and then going too fast and stopping too quickly. Others chipped in with recommendations of tire rotation and proper tire inflation. All these were generally accepted, with scattered reservations. But the most cogent comment came from one participant who said bluntly that increasing tire mileage was simply a matter of "close application of the things we all know." He maintained the subject was apt to be dismissed too lightly, without proper exploration of the many things that affect it. In essence, though, it is not so much a question of finding new devices but of strict attention to the aids already known.

Operations Division Conference

Donald C. Hyde, general manager of Cleveland Transit, chaired the morning session of the day-long Operations Division conference. The general subject was "Operating Expedients Under a Mobilization Economy." Paul Fanning, Municipal Railway of San Francisco, discussed the relative merits of employing women vs. older men, pointed out that, during the last war period, women employed on platform and driver jobs were better than older men.

It was reported that all carriers are now facing a manpower shortage, and many are raising their age limits. Capital Transit, for instance, is faced with such a shortage that it has raised its age limits up to 50 and 55 years.

Discussing the possibilities of relaxation of labor contract provisions, Chester Menne, Connecticut Railway & Lighting Company, highlighted the problem of obtaining part-time operators unless they were paid the full day's guarantee or minimum wage, amounting to anywhere from six to eight hours pay. Again, in connection with the employment of women, Menne said that several companies were prevented from doing this during World War II as the result of obstructionist tactics by the union. He suggested that this question should be settled between union and management now before the present manpower problem gets worse.

"There is one point in connection with shop employees which it may be desirable to touch on," Mr. Menne continued. "Many contracts require promotion in the various shop groups according to seniority, providing the applicant can qualify after a reasonable trial period. When we are employing many substandard individuals during a manpower shortage you may find yourself considering several applicants, disqualifying each in turn because of failure to qualify, but having to grant them all the trial period. This may result in a delay in filling a job and should be provided for in contracts on a permanent basis. However, if such open-end provisions are contained in a current contract it might be possible to have the union verbally agree to some limitation the number of trial periods during a manpower shortage."

Other speakers at the morning session were Robert Kennedy, operating manager, Delaware Coach, and J. B. Moran of the Niagara Frontier Transit.

The afternoon discussion session, chaired by James S.

Some ATA Aphorisms From Baltimore Conferences

"Hot imagination plus cold cash equals good promotion."
E. A. PALMER • Schenectady Chamber of Commerce . . .

"Too many transit operators think their business needs an undertaker instead of a doctor."
LARRY RAILING • Cleveland Transit System . . .

"The transit story is the world's best kept secret."
BILL SPENCER • United Electric Railways Co. . . .

"We're all united in selling our service, the only debate is on the means of selling it."
LOUIS MATHIEU • Metropolitan Transit Authority . . .

"We must make foremen conscious of the fact that they need good employees."
AL LYONS • Philadelphia Transportation Co. . . .

"In training personnel, don't emphasize what they should do but what they shouldn't."
JIM WANSTALL • Delaware Coach Co. . . .

"Let's not be oblivious to the obvious."
PAUL DITTMAR • South Suburban Safeway Lines . . .

"We're finally getting brake religion, and it's high time."
L. W. FISCHER • Timken-Detroit Axle Co. . . .

Osbourne, Cincinnati, Newport & Covington Rwy., raised questions under the general heading of "Maintaining an Effective Work Force Under Current Conditions." Speakers included J. O. Speed, Birmingham Electric; John Gerson, Atlanta Transit; Robert Jones, Virginia Transit; and Norman Wiggins, Philadelphia Transit.

Transit Equipment Men Meet

The all-day Wednesday session of the Association of Transit Equipment Men, Middle Atlantic States, provided a stimulating card of speakers and pulled a fine turnout. Jim Wanstall, ATEM president, made the opening remarks, followed by a brief welcome from A. B. Hanecke, president of Baltimore Transit. From then on Hy Feldman did a lively job of handling the gavel for the interest-packed session.

The first subject, centralized brake control, was particularly timely since it reflected the increasing scrutiny being given brakes all over. As one equipment man put it: "We're finally getting brake religion, and it's high time."

R. G. Shanklin, shop manager for Baltimore Transit, described how his company had fared with centralized brake control since it began the program six months ago. The move was made as a result of examining the company's experience and costs for relining brakes over a five-year period, during which the fleet expanded from 200 to a total of 656 buses.

Shanklin's findings showed that "economical brake overhaul can only be accomplished if you do it in a manner whereby you obtain the most life out of the materials you have to work with. To do this requires good maintenance procedure with good, up-to-date equipment. On a bus with 16½ inch drums we never were able to get over 18,000 to 20,000 miles on a set of relined brakes. Recently the first of several test buses had its lining removed after 14 months and 32,000 miles of operation. The removed lining was three-eighths of an inch and the drums were not scored. It will take more than a year to get over our entire fleet. After this, our brake lining costs should begin to drop, and it is estimated that we will save as much as $30,000 per year over the previous cost."

Another means of saving maintenance expense was explored by A. E. Savage, equipment engineer for Capital Transit, in his progress report on a fuel economy study. At last year's meeting Savage had described how the study was being launched. This year he disclosed some results such as: after a bus goes 50,000 miles a complete overhaul will save gas; and reduction of the shift point on torque converter buses will provide an increase of fractional miles per gallon. It has been a long pull, but Savage can now see that his economy measures are gaining on a fleet-wide basis.

High point of the meeting concerned another topic that was discussed at last year's conclave. This concerned propane operation, and this year S. D. Forsythe, chief engineer, Chicago Transit Authority, was able to report on propane after nearly a year of extensive use. The propane story, up to now, he said, is that it gives a solid two cents a mile advantage over gas, and eight-tenths of a cent over diesel. Forsythe emphasized that he didn't have all the answers but he had discovered such things as the advantage of using gas-well propane rather than refinery propane.

He chalked up these credits for propane: it is the easiest type of bus to maintain; it offers a definite fuel advantage over other fuels; it has a plus value in maintaining engines; and it is extremely quiet. There were, of course, some difficulties. Clean fuel must be used, and there is a need for better metering equipment. During last year's winter in Chicago, there was some trouble with hard starting. And it was necessary to learn how often to take off regulators and clean them. But the public reaction has been good, he said, and "everything is going fine with propane in Chicago."

Everything hasn't gone fine with propane elsewhere, according to other reports. But these reports were based on extremely limited experience. Philadelphia Transit, with two propane buses, is running comparison tests with two gas buses. Each pair runs the identical number of miles, and drivers are shifted from one type to the other. There was considerable stalling at first, and fuel consumption was high. But these troubles are being overcome as familiarity with propane increases. Harrisburg Railways and Capital Transit, on the basis of limited experience with propane, have both found it economical. However, Capital's spokesman had this comment: "Before going all-out on propane, keep low cost diesel operation in mind."

CARS replaced buses, became the only means of public transportation in Detroit when DSR operators struck recently. The bars were down, and autos were parked everywhere —in parking lots, in streets, as . . .

BUSES and streetcars sulked in their own parking lots and garages. The strike, which began April 21, cost the Detroit Department of Street Railways $802,000 in its first three weeks.

City Government Firm in DSR Strike, Longest in Nation's Transit History

By Stanley H. Brams
McGraw-Hill Detroit News Bureau

When conductors and drivers for the Detroit Department of Street Railways walked out on April 21 they began a tieup which has lasted longer than any other major transit stoppage in the United States. Not since the British general strike in 1926 have as many people been inconvenienced for as long a period by a work stoppage.

Although the issues which prompted the walkout were current, the roots of the dispute go back for several years. Division 26 of the Amalgamated in the past had only to threaten a strike or walk out for a few days in order to obtain satisfactory settlements. Hitherto, city administrations had bowed to the pressure of a tieup. This time the administration headed by Mayor Albert C. Cobo stood firm, and downtown merchants—whose waning business in past tieups had led them to pressure the city hall for concessions—stood fairly uniformly behind him. The result was a deadlock.

The demand which prompted the tieup was for a blanket 7½-cent hourly raise. The wage talks first began six weeks prior to the walkout when a 25-cent demand had been filed by the AFL union, but this had never been taken seriously by either side.

The counter offer of the DSR management was a 5-cent boost in the base pay, made on provision that the union would give up some of the fringe benefits of its present contract. A deadlock over these two positions precipitated the strike, only a day or so after union officials had indicated that they would not walk out without due warning.

Strikers Fired Summarily

Once the strike got under way, Mayor Cobo acted promptly under the state Hutchinson Act, which calls for summary discharge of all public utility employes participating in a walkout. The DSR commission ordered letters of discharge mailed to each of 2,700 coach and streetcar operators about 12 hours after they began their strike. Subsequently, the Hutchinson Act became the chief stumbling block in the way of a settlement; the city stood firm on its position that it had no choice except to obey the law. The union took the view that its members were not public utility employes in the sense of the state act, hence should be reinstated without penalty. Under the act, former employes may be rehired, but they are not entitled to raises for one year after their rehiring, and they are on probationary status during that period.

The wage issue faded into obscurity as attorneys for both sides made intensive efforts to find a proposal which would not only save face for both the union and the city, but which would also uncover a working arrangement for the benefit of the employes. For several days the union clung to the position that it would not accept any settlement which heeded the letter of the Hutchinson law. At one time a proposal was nearly approved, calling for the return of all employes at once, coincident with the start of negotiation of a new contract; there would be no discharges prior to a court determination of the legality of the Hutchinson Act, thus delaying punitive ac-

Photos By The Detroit News

NEGOTIATING SESSIONS had labor at the left of the table, management at the right, with the municipal government, represented by Mayor Albert Cobo (at head of table) in the middle. Michigan's controversial Hutchinson Act, which calls for disciplinary action against strikers in public utilities, caused discussions to bog down.

Table of Events

June

15-16—Annual Summer meeting, New York State Motorbus Association, Lake Placid, N. Y.

18-19—Annual meeting, Pennsylvania Bus Association, Pocono Manor.

19-20—Annual Meeting, Inter-City Bus Traffic Association of New York State, Hotel Syracuse, Syracuse, N. Y.

September

12-14—National Association of Motor Bus Operators annual convention, Chicago.

October

1- 4—American Transit Association annual convention, Cincinnati.

tion for, possibly, two or three years. However, rank and file meetings of the strikers rejected this proposal, apparently after a lukewarm presentation by officials of the union.

Aside from the length of the strike, it was unusual in several respects. For one thing, it ran quietly. The walkout was accomplished in the small hours of Saturday morning without incident. The car and bus barns closed in routine fashion. During the course of the strike a few windows were broken in car barns, but that was the extent of property damage as the deadlock wore on. At one union meeting, officials of the Amalgamated declared that share-the-ride clubs and other such instruments were in effect strikebreaking, then threatened to slow down and tie up traffic at rush hours—a threat which apparently was made only to increase the militancy of the strikers, inasmuch as there was never any subsequent effort to carry it out.

City's Business Almost Normal

Another remarkable aspect of the strike was the way the city went about its business in almost normal fashion. For the first week or so the atmosphere was light-hearted—people without transportation thumbed rides; share-the-ride pools were set up all over the city; and an almost carefree air prevailed. This began to settle down into placid acceptance of the situation; many people grumbled but in the same breath they took the position (reflected by remarks on the street, letters to the newspapers, letters to city officials, and so forth) that the city had every right to stand beside its guns, and should.

After the first working day of the tieup, Monday, April 23, absenteeism in the factories dropped almost to normal levels, and tardiness all but disappeared. It took two or three days longer than that for tardiness to reduce in downtown offices.

Downtown stores were the chief sufferers. Their business dropped 50 per cent or more during the first few days of the strike, then leveled out at about 30 per cent under normal. The stores soon began remaining open in the evenings, so that one-car families whose transportation was being used by the breadwinner during the day might be able to come downtown in the evening to shop. These night shopping hours, two days a week (Monday and Thursday) balanced out volume reductions during those days, and made store operators more willing to wait out the situation.

There appeared little doubt but what the transportation habits of the city were being somewhat revised by the exigencies of the strike. Share-the-ride pools were flourishing as they never had since the war days. With a 15 cent fare in effect on the transit lines today, these gave some evidence of continuing.

Taxi drivers told of ride-sharing groups of girls whose total fare amounted to a nickel or so apiece more than they would have spent on the surface lines. "You don't think they will ever go back to the crowded streetcars, do you?"

When the employes walked out, they were striking to better an extremely high level of wages, said in some quarters to be the highest for any transit system in the United States. One set of figures showed that about 25 per cent of the employes had take home pay of more than $100 a week, and that of the remainder nearly all had incomes of about $90 a week, largely due to fringe benefits which have crept into the contract in years past, such as show-up time, sick leave provisions, overtime, and other factors.

The High Cost of Fringes

The cost of these fringe benefits is staggering. For example, in 1950 the drivers and conductors worked 5,845,752 hours outside of their home terminals. At a "productive" payrate of $1.67 an hour, the wage bill would have been slightly less than $9,800,000. Actually, however, the payroll was $14,896,795.

About $3,000,000 of this money paid above the productive pay rate was in benefits given the workers under the contract. These included such items as: Daily overtime and off days and holidays worked, $719,120; vacation payments $678,862; sick leaves $328,-

238; pensions $1,319,823; hospitalization $84,672; and group insurance $57,993.

The approximately $2,000,000 remaining in surplus payments went into special benefits of various sorts—reporting and closing out time, daily guarantees to extra men, minimum pay for reporting, and the like. It was on the basis of elimination of these fringe payments that the city made its 5-cent offer—in other words, the department offered a straight pay raise which it figured was the equivalent of the fringe benefits paid up to now.

Shortly after the strike got underway, progressive layoffs of nonstrikers began. Maintenance men, clerks and salaried workers were furloughed about ten days after the strike got underway. By a week later, only about 250 of the 6,532 people normally employed by the DSR were still on the job. These were vital employes in various positions who could not be laid off under any circumstances.

'Operating Ratio' Rule Granted Jersey Firms

The "operating ratio" principle of determining bus fares was written into the New Jersey statute books last month by the state legislature, to the great satisfaction of operators there.

Under the new law—still to be approved by Governor Alfred E. Driscoll—the Public Utilities Commission is authorized to establish fares sufficient to cover costs, including depreciation and taxes, and still return a "reasonable" profit. The reasonable profit, says the law, would be not less than five nor more than ten per cent of total operating revenues.

Formerly, the board took into account only the original investment in the company, discounted operating expenses entirely.

New Jersey's chief executive had 45 days to approve or turn down the law.

George M. Eichler, general counsel for the New Jersey Motor Bus Association, says that if the law does go into effect, the probability is that the commission, in setting rates, will adhere to the old principle for a while, work the new one in gradually. Nevertheless, he's pleased with the action of the legislature.

Transit Progress Day Set for September 24

One hundred years ago, in 1851, the horsecar business began to expand rapidly in New York and Boston. Thus it was only fitting that "One Hundred Years of Transit Progress" should be chosen as the catch phrase of Transit Progress Day, to be celebrated this year on Sept. 24.

The day is, according to Guy C. Hecker, executive manager of the American Transit Association, one of the industry's most effective public relations activities.

Mr. Hecker last month announced the decision of the ATA's Public Relations Division to appoint Fred W. McCluer, public relations director of the Youngstown (Ohio) Municipal Railway Co. to the post of chairman of the Transit Progress Day Committee.

GEORGE W. PHEIL, publisher of both BUS TRANSPORTATION and FLEET OWNER, has been elected to the Board of Governors of the National Highway Users Conference. Mr. Pheil was also named to the conference's Defense Committee. NHUC Chairman Albert Bradley, in announcing Mr. Pheil's election, pointed to the publisher's "very fine work on behalf of the bus and truck industries over a period of years." He added that, "This knowledge of highway transportation will contribute greatly to the NHUC efforts."

As publisher of BUS TRANSPORTATION and FLEET OWNER, both McGraw-Hill magazines, Mr. Pheil has been in close touch with problems affecting the two transportation industries. He has served on many advisory groups and has cooperated with industry spokesmen in helping to bring about a better understanding by both the government and the public of the vital role being played in the defense effort by the bus industry.

Work to Get Started On Cleveland Rapid Transit

Contracts calling for the expenditure of $2,500,000 were to be awarded this month for some of the necessary preliminary work on Cleveland's long-awaited rapid transit system.

It was just part of a lot of money that Cleveland will spend during the next couple of years on its new transportation system. The last barrier standing in the way of a $22 million loan from the Reconstruction Finance Corporation was swept away last month when the Cleveland Transit System, the Nickel Plate Railroad and the RFC came to an oral agreement on the terms of the purchase of eight miles of right of way over which the rapid transit cars will run. Another deal, with suburban Shaker Heights, was also approved.

CTS officials asked the National Production Authority — with the blessing of the Defense Transport Authority—for priorities on materials to build the line.

The agreement with the Nickel Plate calls for CTS to buy eight miles from the railroad for its right of way. The price was $2,750,000, to be paid off in semi-annual $60,000 installments at three per cent interest.

Earlier, CTS had made a similar agreement with the New York Central, to buy three miles of right of way.

Under a separate agreement with Shaker Heights, CTS will share Shaker's tracks over part of the rapid route.

Estimated cost of the entire project three years ago was $22 million, and that's the sum the RFC was asked to lend. Now, however, CTS engineers say the cost may go as high as $28 million, maybe $30 million. RFC officials haven't formally been told so yet, but their engineers are said to know it.

Roy W. Crum Stricken; Was Research Director

Roy W. Crum, director of the Highway Research Board of the National Research Council and one of the nation's foremost engineers, died last month in Washington. He was 66.

Mr. Crum, whose specialty was research in the field of highway engineering, had served as director of the board since 1928. During the past year he had directed the board's large-scale road test in southern Maryland to determine the causes of road failures.

Pioneer Bus Company Into Port Arthur

The 57,000 residents of Port Arthur, Texas, found out last October what it's like to go without bus service when drivers of the Port Arthur City Lines, a National City Lines affiliate, walked off the job and never returned. *Continued on page 88*

LABOR DEVELOPMENTS IN THE BUS INDUSTRY

BY PHILIP B. WILLAUER • SIMPSON AND CURTIN, PHILADELPHIA, PA.

BARGAINING AUTHORITY

The negotiations and the arbitration hearings concluded last month between Twin City Rapid Transit and Amalgamated Division 1005 should serve as a timely warning to bus management. Division 1005 proposals for the contract year beginning January 1, 1951, included two requests on behalf of former TCRT employes who have been retired on pension. Institution of hospitalization and medical insurance at the sole cost of TCRT to cover both employes and former employes on pension was asked; and also the assumption by TCRT of the full cost of life insurance policies covering employes and former employes now on pension. These requests squarely raise the questions—What is the scope of a bargaining agent's representation under the T-H Act? Must an employer collectively bargain with respect to former employes who have been retired on pension?

If the bargaining agent's representation authority extends to employes who have been retired and if an employer must bargain with respect to such former employes, the scope of bargaining, already broad, would be very substantially extended. Employers could be compelled to bargain relative to improved pension rights, life and other forms of insurance, hospitalization, part-time employment privileges, rehire rights in event of manpower shortages, and a host of other matters particularly applicable to pensioners. This would in turn enormously increase the potential financial liability of the employer.

Fortunately, the T-H Act, as also the Wagner Act before it, confers no such representation right upon bargaining agents and imposes no such obligation to bargain on employers. The authority of the union under the law is limited to the right to represent and bargain for employes within an appropriate bargaining unit. When an employe leaves the bargaining unit by reason of a voluntary quit, discharge, retirement, transfer to a position outside the bargaining unit or other cause, the bargaining agent has no right of representation of such person, and the employer is no longer compelled by law to bargain with the bargaining agent concerning such individual.

Obviously, an employer may, if he wishes, voluntarily bargain with a union concerning such individual and can even obligate himself by contract to bargain concerning such individual. But such action on the part of the employer is wholly voluntary, it is not and cannot be compelled by law.

LIMITATION RECOGNIZED

NLRB has itself recognized this limitation on representation and bargaining rights under the T-H Act and its predecessor in the *Public Service Corporation Case*, 72 NLRB 224 (1947) where it denied the request of the company and the intervenor union that some 300 to 350 pensioners be permitted to vote in a representation election. NLRB declared there that "Such pensioners have no duties or obligations with respect to the employers . . . We have considerable doubt as to whether or not pensioners are employees within the meaning of Section 2 (3) of the Act, since they no longer perform any work for the employers, and have little expectancy of resuming their former employment. In any event, even if pensioners were to be considered as employees . . . they lack a substantial community of interest with the employees who are presently in the active service of the employers."

Were any additional confirmation required, it is to be found in the *Inland Steel Case* in which the Federal Circuit Court declared that retirement effects a termination or severance of the employment relation as effectively as does discharge. Consequently, a bargaining agent may bargain concerning the conditions attending the act of retirement just as in the case of discharge, but beyond that it has no bargaining or representation authority under the T-H Act.

TCRT correctly maintained before the Board of Arbitration that the latter had no jurisdiction or authority to consider or determine the proposals of Division 1005 on behalf of TCRT pensioners. Amalgamated's response to this TCRT position was relevant, though somewhat far-fetched, in just one respect, viz., asserting the existence of a voluntary "practice" of bargaining at TCRT on behalf of pensioners.

This alleged "practice" was founded upon an increase, granted under a pension agreement voluntarily negotiated by the parties in 1950, in the pension allowances of individuals previously pensioned.

NOT A PRECEDENT

One instance of generosity does not establish a "practice," but on such a subject as pensions, three or more such instances might persuade a board of arbitration to the contrary. An amended Ford-UAW pension agreement increasing allowance to individuals already retired provides "but upon the understanding that this is due only to the special circumstances attending upon this settlement agreement, and is not to be considered an endorsement by the company of the proposition that any future revisions in retirement benefits should be applicable to persons then already retired."

Last month they did something about it. By more than 12 to one, voters in the Gulf city voted to award a 25-year franchise to W. M. Rush, operator of the Pioneer Bus Co. in nearby Houston.

So ended six months of walking or using the family car.

'Service-at-Cost' Comes to Worcester

Worcester (Mass.) Transportation Associates and its operating subsidiary—which means the Worcester Street Railway Co.—has taken a big step and placed itself under the service-at-cost sections of the Massachusetts street railway statutes.

In taking advantage of the law which has been on the state's books since 1918 the company made a guinea pig of itself; it is the first company in the Bay State to put itself under the 33-year-old law, one of the first in the east to embrace service-at-cost.

The law, like similar statutes in other states, provides for an automatic adjustment of rates to conform to changes in the cost of service. "Cost of service" includes operating expenses, taxes, interest, and such allowances for depreciation, obsolescence and losses in respect to property lost, sold or abandoned as may be fixed from time to time by the Department of Public Utilities. It also includes six per cent interest per annum on the stock investment of the company, which in the Worcester case means six per cent of the $2,164,000 par value common stock outstanding.

The company will file nine fare schedules with the department—four of them to provide for progressive increases in fares, four to provide for progressive decreases, and one sufficient to enable the company to meet the cost of service. The department is to appoint one or more resident supervisors to the company management. It may order special investigations at the company's expense, and the governor is to appoint three members of the board of directors.

Another principal provision of the act is that the company undertakes when it accepts the statute to sell its property and franchise to the Commonwealth or to any city or town at any time for the amount of the stock investment.

Losses of $433,000 over the past four years led stockholders to vote for service-at-cost. They hope thus to be able to draw six per cent dividends on their stock.

WASHINGTON REPORT

The House Ways and Means Committee, which has a strong voice in guiding the House of Representatives when it comes to raising taxes, voted last month to increase the levy on gasoline by half a cent per gallon. It was a break for bus operators, who had been prepared to see the gas tax go up from one and a half to three cents a gallon.

But the committee did recommend that diesel fuel—now free from any federal impost—be taxed at the gasoline rate.

How would the proposed tax affect bus men? In 1949, last year for which figures are available, 21 BUS TRANSPORTATION ME award winners, with 6,133 buses among them, burned 40 million gallons of gasoline and only 19 million gallons of diesel fuel. Apparently it would hurt a little less to have diesel fuel taxed than to have the tax on gasoline doubled.

* * *

While the congressmen were busy trying to raise the $10 billion asked by the administration, they turned to another field—buses and trucks and automobile accessories—and recommended that the present five per cent tax on them be increased to eight per cent. That would get another $117 million into the coffers.

The National Production Authority says that about 35,000 more bus and truck tires, or an increase of 10 per cent, are being manufactured weekly because of the ban on the fifth tire on passenger automobiles. The April jump in production, said the NPA, cut the big tire shortage from 200,000 tires down to about 140,000.

* * *

Placed on the "Class B Product" list of the Controlled Materials Plan last month were buses and parts and accessories for buses, excepting, in both cases, trolley buses. Manufacturers who wanted allocations of materials to build buses and bus parts had to file for them by the end of last month.

CMP, actually a timetable which requires that manufacturers order controlled materials on a time schedule and deliver the finished product on a time schedule, is unlike the World War II priority plan in that it will not allocate all the available supply of a given material. Estimates on how much will be left over after priority holders are served vary—some say they are guesswork—but the leftovers may amount to as much as 70 per cent for some materials.

"Class B", in which buses are now included, is to be served first.

Wide World Photo

FILLED TO CAPACITY was the parking lot on top of the Port of New York Authority Bus Terminal on the day that Gen. MacArthur paraded in New York City. The roof parking lot has a 450-car capacity, has seldom in its six-month lifetime had to turn away potential parkers.

SHORT HAULS

IN A GOODWILL GESTURE, Valley Transportation Co., of Lemoyne, Pa., lent its garage as an exhibition hall recently. The show was sponsored by dealers and distributors of household appliances and automobiles in the communities known as Harrisburg West. The show ran a week and was attended by 100,000 people.

More than half a hundred trolley lovers—or bus haters, whichever you prefer—rolled over the remaining 65 miles of track in Brooklyn and Queens, N. Y. recently on the sixth annual trolley tour conducted by the Transit Improvement Association. Object: "To prove that the trolley is more economical, more comfortable and safer than the bus." . . . Riders on **Memphis Street Railways Co.** recently have noticed sweet-smelling perfumed advertisements; now they read the ads and smell the product, impregnated on a small piece of blotting paper and attached to the car card, at the same time. . . Oneida county (Wis.) school teachers urge that radios be placed in school buses to utilize the time that pupils spend getting from home to classes and back again. . . The **Port Angeles, Wash., Transit System** has been sold by owner Lou Kiszak, who had been having trouble with the city commission over his delinquent occupational tax. . . An **Atlanta, Ga.,** statistician has figured out that Atlantans ride trolleys more than citizens of any other U. S. city—an average of 241 trips annually, compared to 219 transit rides per person in the rest of the nation's cities. . .

* * *

Tampa (Fla.) Transit Lines, Inc., backed down in the face of public pressure recently, decided to redeem all tokens after a fare increase; earlier it had announced it would instruct drivers to accept the old tokens only in groups of four, and that persons with odd amounts would have to take them to the company's main offices. . . Police Dept. radio served a purpose when the **Frank Martz Coach Co.,** of Wilkes-Barre, Pa., reported a lost bus in New York City the other day—New York police broadcast an alarm, and got an answer telling where the bus was by return radio message. . . The Travelers Insurance Company reports that buses are far down the list of vehicles involved in accidents. In 1950 **only 1.3 per cent** of all vehicles in **fatal accidents** were buses, compared to 1.8 per cent during the previous year. In **non-fatal accidents, 2.1 per cent** of the vehicles involved were buses, compared to 2.5 per cent in 1949. . .

* * *

Louisville Railway Co. officials estimated that the transit line carried 1,000 more people to the Kentucky Derby at Churchill Downs this year than last. About 100,000 persons were at the track—whether or not they saw the race is another matter. Two days later, incidentally, on May 7, the **Louisville Transit Co.** was born when the railway company and **Capital Transit Co., Frankfort,** were merged. . . Bus conductors in Glasgow, Scotland, went on a "free fares for all" strike one day recently, but quickly called the whole thing off when thousands of Scots swarmed onto the free ride. . . Sidelight on the **Detroit Street Railways** strike: scores of motorists, unable to either ride the transit system or park their cars in jammed downtown Detroit, took to driving through the Detroit-Windsor tunnel, parking on the Canadian side, and riding back via bus. . . **Wisconsin Public Service Co.,** in Green Bay, likes propane so much that it will convert 28 more buses. It had tested propane on two test buses. . . The California Public Utilities Commission has authorized **Los Angeles Transit Lines** to buy 25 buses, to cost $500,000. . . Meanwhile **LATL** announced that it would ask for a fare increase to 15 cents for each zone. . .

* * *

Operators on **St. Louis Public Service** vehicles are wearing new badges, similar in design and color to the company emblem. They are worn on the operators' hats, are emblazoned with the words, "Safety, Courtesy, Service." . . . The **"honor" parking lot** in Greensboro, N. C.—first of its kind in the country—proved a **failure.** Idea was for motorists to calculate their own parking charges, then pay up. They didn't. . . The **New York City Transportation System** has a new FM radio station, over which, in the station's first official broadcast, Col. Sidney H. Bingham, chairman of the Board of Transportation, read greetings to drivers. . . Drivers on the **London (Ont.) Street Railway** system were still incognito last month—the executive committee of the municipally-owned company reconsidered an order which would have made drivers post their names in their buses. . . Work has begun on an eight-mile **scenic highway** at Nags Head, N. C., which will carry travelers to one of the tallest lighthouses on the Atlantic Coast, on Bodie Island. . . **Lincoln (Neb.) City Lines** is the latest to join bus companies which are hiring women to drive buses. . .

* * *

The State of Florida, aiming to augment normally heavy winter tourist travel with spring and summer tours, expects throngs this season on organized bus tours. . . The first bus on a new service between Mammoth Spring and Harrison, Ark., was welcomed with a parade. Driving on the inaugural run was Joel Akers, owner and president of **Harrison Motor Coaches. . . Teche Greyhound Lines** drivers on the Atlantic-Columbus Division have won the Bill Fields trophy, awarded to the Teche division with the best accident prevention record. They went an average of 157,509 miles between accidents.

Continued on next page

PERSONALS

JOHN C. BAINE, vice president and operating manager of the St. Louis Public Service Co., is transportation services chief under the St. Louis civil defense organization. **Raymond R. Tucker,** civil defense director in the Missouri city, said that the utility will plan and organize the transportation services of the city in case of attack.

LIONEL J. CUCULLU has been named chief engineer of New Orleans Public Service, Inc., succeeding **Lyall G. Ireland,** a vice president of the company, who has retired.

Mr. Cucullu, a past president of the Louisiana Engineering Society, has been with NOPSI for 20 years. He is a native of New Orleans and a graduate of Louisiana State University.

Appointed to succeed Mr. Cucullu as assistant chief engineer was **G. E. May,** formerly chief utilization engineer.

E. C. GIDDINGS, a vice president of Capital Transit Co., Washington, D.C., has been elected to non-active membership in the National Press Club.

N. H. HAWKINS, JR., is president, general manager and chairman of the board of directors of Birmingham Transit Co., formed recently when the transit holdings of the Birmingham Electric Co. were sold to a group of Birmingham business men by order of the Securities and Exchange Commission.

H. G. Ford, Jr., has been named vice president and operating manager; **Leroy E. Costner** is secretary and treasurer; and **C. D. Harrell** is assistant vice president and general claim agent.

Mr. Hawkins had served since 1947 as vice president in charge of operations and as a director of BECO. He is a director of the American Transit Association.

F. NORMAN HILL has been elected president of Capital Transit Co., Little Rock, Ark. Mr. Hill, formerly southern regional manager for nine National City Lines operations in the South, went to Little Rock as general manager when the Capital Transportation Co. was reorganized recently. He has also served as general transportation manager for Baltimore Transit Co.

H. A. Tune, formerly president of the company, has been elected chairman of the board of directors.

In still another move, Capital Transit Co. recently brought Philip E. Askey, formerly division manager of Baltimore Transit Co., to Little Rock to serve as vice president in charge of operations and personnel.

Mr. Askey, who is well known to transit men, is active in the American Transit Association. He began his transit career as a statistician for St. Louis Public Service Co., and later headed that company's research department.

He moved to Baltimore in 1947 to become director of personnel.

S. N. HINES has been appointed Greyhound passenger agent for New York City. He was formerly ticket agent at Greyhound's Capitol Terminal. In other Greyhound appointments, **H. Ray Lizza** was named assistant manager of the Penn Terminal and **William Passeggio** was made chief baggage agent for the New York City area.

C. J. JACOBSEN, National Association of Motor Bus Operators treasurer, was honored recently on the completion of his 48th year with the National Metropolitan Bank, Washington, D. C., of which he is president.

L. S. LANCASTER has assumed his new duties as manager of the Lawrenceville (Ill.) Transit Lines. Following a recent change in ownership of the property, Mr. Lancaster, **A. C. Stoltz, J. C. Powell, Stoy Fox** and **Lyle Cochran** became directors of the company.

WILLIAM McWHORTER, Akron Transportation Co. mechanical department employee for 26 years, has been named superintendent of equipment.

Mr. McWhorter joined ATC in 1925 as a carpenter. In May, 1949, he became foreman of the main repair shops at Kenmore, Ohio.

He succeeds **E. C. Krueger,** who has become superintendent of equipment at Indianapolis Railways, Inc.

WILLIAM G. WOMACK, connected with the transit system in Richmond, Va., for the past 19 years, has been made assistant manager of the Virginia Transit Co. For the past six years Mr. Womack has served as assistant to the vice president and general manager. He is a 1932 graduate of Randolph-Macon College.

L. H. Costa

L. H. COSTA, former secretary and comptroller of the Columbus Transportation Co., Columbus, Ga., has been elected president to succeed **Leland Anderson,** who remains as a member of the board of directors.

CHARLES K. MORNINGSTAR was recently named general manager of the London (Ont.) Street Railway Co. Since 1945 Mr. Morningstar has served the company as purchasing agent and assistant general manager.

In another appointment, **Jack Bell** was made purchasing agent.

FLOYD E. NOLFF has been named maintenance superintendent of Tulsa City Lines. He replaces **E. J. Fox.**

TRUBY B. O'STEEN, traffic manager of Florida Greyhound, was elected president of the Southeastern Bus Traffic Association at a recent meeting in Miami Beach.

He succeeds **R. E. Coleman,** of Albany, Ga.

Other officers elected at the gathering: **R. A. Trice,** traffic manager of Virginia Stage Lines, Charlottesville, Va., vice president; **R. M. Medlock,** vice president and treasurer of Southeastern Stages, re-elected treasurer; and **M. E. Wood,** re-elected secretary of the Association.

PACIFIC GREYHOUND LINES has announced three recent promotions:

Lloyd E. Shippey has been named regional traffic manager in San Francisco; **Bob Hutchinson** will move to Portland, Ore., as regional traffic manager; and **Lloyd L. Lortz** has been appointed to the position of assistant general traffic manager — sales promotion.

Mr. Shippey has been district traffic manager in the northwest for the past 13 years. Mr. Hutchinson was formerly district passenger agent with headquarters in Medford. His new territory will extend from Vancouver, B. C., south to Eureka, Kla-

R. F. MacNally

math Falls and Weed, and will include eastern Oregon. Mr. Lortz has been district traffic manager in San Francisco for the past two years.

GEORGE O. PETERSON has been appointed by Northland Greyhound to the new position of city passenger agent for Duluth and Superior and manager of the Duluth terminal.

Mr. Peterson has served Northland in the Superior area for the past 24 years.

WILLIAM H. SCOTT, manager of San Francisco's Municipal Railway since 1941, has announced his retirement, effective Aug. 1.

Mr. Scott began his transportation career with the Southern Pacific Railroad. He joined the Municipal Railway as a cost accountant's bureau of accounts in 1935; and became manager of the railway six years later. One of his biggest headaches came with the acquisition and consolidation of the Muni with the old Market St. Railway in 1944.

Charles Miller, operating manager of the Railway, has been appointed acting manager to work with Mr. Scott until his retirement.

HARRY M. MILLER, formerly a member of the Ohio Public Utilities Commission, has been elected vice president of the Columbus and Southern Ohio Electric Co., parent firm of the Columbus Transit Co.

R. F. MacNALLY has been promoted to vice president and general manager of operations and **Donald E. Hanson** to the position of vice president and comptroller of the San Diego Transit System.

Mr. MacNally will have full charge of maintenance, operations and claims, and Mr. Hanson will be responsible for accounting, finance, taxes, insurance and public relations.

A native of Springfield, Ohio, Mr. MacNally joined the Spreckels Companies in 1935 as operating assistant for the San Diego and Coronado Ferry Co. He became superintendent of maintenance for the San Diego Electric Railway Co., forerunner of the present San Diego Transit System, early in 1941, assistant to the vice president of both the ferry and railway companies in 1942 and vice president in 1946.

Mr. Hanson is a native of Fremont, Nebraska, and studied at the University of Nebraska. He came to San Diego in 1927 as comptroller for the Spreckels interests and in 1931 was made secretary-treasurer of the southern Spreckels companies. He was elected to the position of vice president in 1946.

C. E. WICKMAN, chairman of the board of the Greyhound Corp., asked that he not be re-elected to that position or to membership on the executive committee when directors held their annual meeting in Chicago recently. He will continue to serve as a director and consultant.

The request was made because of the state of Mr. Wickman's health and because he is slated for retirement next year under Greyhound's compulsory retirement program.

Orville S. Caesar will assume the duties of chairman of the board in addition to continuing to serve as president of the corporation.

OBITUARIES

BEAUDRY LEMAN, 74, a director of Montreal Tramways Co. and chairman of the board of directors of the Canadian National Bank, died recently in Montreal.

D. E. Hanson

PATRICK T. REILLY, president of Delaware Coach Co. and its affiliates, Southern Pennsylvania Bus Co. and Delaware Bus Co., died last month at the age of 74.

Mr. Reilly, a veteran of 55 years in the transit industry, had been president of Delaware Coach Co. since last September. He had been vice president and general manager since 1944.

WADSWORTH WINSLOW, who until his retirement a year ago was vice president and general manager of the Boston, Worcester and New York Street Railway Co., died last month. He was 62 years old.

Mr. Winslow served as an executive of the B & W for 14 years. Earlier he had been with Interstate Transit Corp. in Attleboro and with the old narrow gage railway in Boston.

TEN MORE TWINS were accepted last month by J. E. Ebinger, left, vice president of Wichita (Kansas) Transportation Co., from R. B. Leland, sales executive for Twin Coach Co. The company now has 84 propane Twins in use.

NEWS FROM THE MANUFACTURERS

ALUMINUM COMPANY OF AMERICA's board of directors recently elected President **Roy E. Hunt** chairman of the executive committee and Senior Vice President **I. W. Wilson** president of the company.

Arthur V. Davis continues as chairman of the board. Elected vice president and general counsel of the company was **Leon E. Hickman.**

Mr. Hunt, son of one of the founders of the firm, has been with Alcoa since 1901. His 23 years as president of the company marked the longest tenure in Alcoa's history.

Continued on next page

Bachrach

A. G. Decker

BLACK & DECKER MANUFACTURING CO., Towson, Md., is now headed by **Alonzo G. Decker**, a co-founder of the company.

Mr. Decker succeeds **S. Duncan Black**, former president, who died recently.

Mr. Decker has served as vice president and general manager of the portable electric tool firm since he and the late Mr. Black started the operation in 1910. He has devoted his efforts to the design and manufacturing phases of the business since its inception. He had much to do with developing the first "universal" motor to be used in a portable electric tool.

CUMMINS ENGINE CO. has announced the merger of two wholly-owned Cummins sales and service organizations with Cummins Diesel Sales Corp. and the appointment of a general manager.

* * *

William B. Lawrence, formerly Cummins' regional manager for the Rocky Mountain region, with headquarters in Denver, has been named general manager of the sales corporation. He will have his office in Columbus, Ohio.

W. B. Lawrence

Subsidiaries affected by the merger are Cummins Diesel Sales Corp. of Illinois, and Cummins Diesel Sales and Service of New York, Inc.

AMERICAN FIDELITY insurance companies and Markel Service have named **Samuel A. Markel** chairman of the board and have elected two presidents; **Lewis C. Markel** is president of Markel Service, Inc., and **Irvin S. Markel** now heads up American Fidelity Fire Insurance Co. and American Fidelity and Casualty Co.

The two new presidents retain their vice presidenices in each other's companies. Irvin Markel is also treasurer of Markel Service, and Lewis Markel is still treasurer of AF & C.

ELECTRIC SERVICE MANUFACTURING CO. of Philadelphia, has announced the appointment of **Glenn R. Smith** as district sales manager in its Washington, D. C. office.

Mr. Smith was previously in the Detroit office. He has been replaced there by **Walter W. Dearolf, Jr.**, who moved from Philadelphia.

GMC Truck and Coach Division has received contracts from the Detroit Ordnance Tank-automotive Center for 851 tank trucks for the U. S. Army.

Total value of the contracts was put at nearly $3,500,000.

THE PATHFINDER DIVISION of the Superior Coach Co. has nearly completed construction of a new multi-million dollar bus manufacturing plant—to employ about 500 persons—near Kosciusko, Miss.

The building occupies about 150,000 square feet on a 50-acre plot. Officials of the company say the new plant is scheduled to turn out some 17 buses daily, when the plant is in full time operation.

PERFECT CIRCLE CORP. sales division has announced three personnel changes:

Ken Sloane, with the firm for 17 years—most recently as manager in New York—has been moved to Indianapolis to fill the vacancy created by the death of **Jack Sherry**.

Replacing Mr. Sloane in New York is **Jack Taylor**, with Perfect Circle for 18 years. He has served as both district and regional manager in replacement sales.

Named sales promotion manager, to replace Mr. Taylor, is **Cliff Storey**, who formerly handled special merchandising assignments in replacement sales.

F. T. Roberts

FRED T. ROBERTS has been made manager of truck, bus and trailer wheel sales of the Budd Company.

A veteran of 25 years with Budd, he has been in the Company's wheel sales division since 1928. In 1933, he was placed in charge of all wheel service and distributor wheel sales. He will continue in this capacity.

RAYBESTOS-MANHATTAN, INC., has elected **George W. Marshall, Jr.**, and **Alvin F. Heinsohn** as vice presidents of the company.

Both men are directors of the firm.

ROY H. SJOBERG, manager of the automotive and machine divisions of the Canadian Car and Foundry Co. in Montreal, has resigned his post. Mr. Sjoberg, well known in the transit industry in the United States, was formerly a vice president of ACF-Brill.

R. J. SIGAFOO has been appointed assistant to the president of Twin Coach Co., Kent, Ohio.

He has been affiliated with the company for the past two years as engineering consultant specializing in motor coach design. He recently assisted L. J. Fageol, Twin president, in the development of the Fageol Twin Coach "Convertible," a combi-

R. J. Sigafoo

nation bus-truck which can also be converted for use as a military litter carrier or field hospital.

SINCLAIR RESEARCH LABORATORIES, a multi-million dollar research plant at Harvey, Ill., are being thrown open to "any American with an idea for a new or better petroleum product or application," said President P. C. Spencer, in announcing the "Sinclair Plan."

"This plan," he said, "provides all the necessary technical facilities and skilled personnel to any American with an accepted idea, to bring that idea from the roughest scratch-pad stage to final pilot-plant testing.

"Here at Sinclair Research Laboratories are extensive facilities for the research, development and pilot-plant testing of all ideas relating to petroleum and petroleum products. We propose to make a portion of this complex plant available to the public for the study, development and proving out of ideas."

According to the plan, the laboratories will test the most promising ideas selected by the laboratories' directors. In return for its investment of money, time, facilities and personnel, Sinclair receives the privilege free of royalties.

"This in no way impairs the inventor's opportunity to sell his idea in all other quarters, or to make any kind of arrangement he wishes outside of his agreement with Sinclair," said Mr. Spencer.

TWIN COACH CO. has announced a net profit of $273,815 for its first quarter operations. It is equal to 51 cents on each share of common stock, after provision for preferred dividends.

In the same period last year Twin lost $144,952.

Both the bus manufacturing and the aircraft division of the firm profited during the first three months of this year, said President L. J. Fegeol. Sales totaled about $7,560,000, approximately 300 per cent more than in the similar period of 1950.

UNITED MOTORS SERVICE of General Motors Corp. has named **Charles P. Culhane** general sales manager.

SPRINGFIELD (OHIO) CITY LINES got 20 new Marmon-Herrington propane coaches last month, eight of which are shown here. All 31-passenger models, they brought to 85 the total of buses now in service in Springfield.

He succeeds **L. W. Martin,** who died recently.

Mr. Culhane had been eastern regional manager of United Motors Service since January, 1946. He brings to his new position wide experience in the automotive parts and accessories industry as carried on by United Motors Service.

VAPOR HEATING CORP., Chicago, has appointed two service officials:

G. C. Scott is service assistant to the vice president in charge of sales. For the past few years Mr. Scott has been service manager. He has been with Vapor for 18 years.

R. J. Armbrust has been named service manager, replacing Mr. Scott. He joined the Vapor organization nine years ago.

THE WARD BODY CO., Conway, Ark., manufacturers of school bus bodies, has been awarded a government contract to make about 750 buses.

WILMOT F. WHEELER has been elected chairman of the board of directors of American Chain & Cable Co., Inc., and will continue as its chief executive officer. **Cyrus N. Johns** has been named president, and **Col. Harry D. Week,** the inventor of the Week tire chain, has been added to the board of directors.

WHITE MOTOR CO. has agreed to purchase virtually all the assets of the Sterling Motor Truck Co., Milwaukee, Wisc.

The agreement was announced last month by Robert F. Black, president of White, and William G. Sternberg, president of Sterling.

It is subject to the approval of holders of 70 per cent of the Sterling stock. It calls for the Sterling Company to be dissolved as soon as practicable after the transfer to the White company of its assets. White plans to continue operations at the Sterling plant.

Mr. Black said that the purchase will extend White's line of trucks in the heavy duty, special purpose truck markets.

• • •

Sales, including parts and accessories, of the White Motor Co. for the three months ended March 31 amounted to $36,415,000, compared to $19,557,000 for the first quarter of 1950.

Net profit for the period this year came to $1,375,000, or $1.99 a share.

OBITUARIES

WILLIAM T. HUNTER, 71, retired former president and general manager of A. Schrader's Son, died recently in a White Plains, N. Y., hospital.

Mr. Hunter, one of the pioneers of the automotive industry, was also a former vice president of the Scoville Manufacturing Co.

He retired in 1949.

Mr. Hunter began his career with A. Schrader's Son in 1910 as secretary, assistant treasurer and a director. He became general manager in 1922, vice president in 1924, and in 1930 was named president, in addition to his duties as general manager.

FINANCIAL

BALTIMORE TRANSIT CO.—after reporting deficits for the first two months of the year—recently announced a net income of $54,904 for March, after provision for debenture interest.

This compared with a deficit of $145,238 last year.

The March profit, however, was not sufficient to offset the earlier deficits, so the company showed a net loss of $123,451 for the first quarter.

For the similar quarter of 1950 there was a net loss of $495,830.

Gross operating revenues for March amounted to $2,-

140,058, an increase of $173,201 over last year.

For the three months gross was $6,073,290, up $459,485 or 8.18 per cent compared with 1950.

Revenue passengers for March totaled 15,655,033 as compared with 17,764,244 a year earlier.

The passenger total for the first quarter was 50,572,488, a drop of 5,759,216 from the same period of 1950.

CHICAGO TRANSIT AUTHORITY posted a deficit of $123,969 and ran its three-month total losses to $896,558 during the month of March.

Revenues for March came to $9,693,229, compared to $10,299,913 for March, 1950. Operating and maintenance expenses for March were $8,767,156, compared to $8,983,165.

It was the provision for depreciation — $625,000 in March—that threw CTA into the red ink. Even so, the figure for March, 1950, was $541,667, and the authority made money then.

With the month's financial statement, CTA included a report on the status of its equipment modernization program. It said, that to date 324 propane buses have been delivered and 227 remain to be delivered; one trolley bus has come through, with 349 to come; and 130 el-subway cars have come, and 70 are on order.

So far a total of 455 units have been delivered on 1950 orders, and 646 are coming. Delivered under previous orders were 1,714 units.

HONOLULU RAPID TRANSIT CO. reports that a strike and a decline in the number of passengers carried last year cut revenues well under the 1949 figure.

D. Thomas Eddy, vice president and general manager, reports 1950 transportation revenues were $3,936,082 — down $479,608 from 1949.

Prior to the December strike, there had been an 11.3 per cent decrease in adult revenue passenger fares over the first 11 months.

Net profits declined from $329,454 in 1949 to $231,574 in 1950.

An FM radio station installed in March 1950 was credited as "one of the greatest strides in the coordination of supervision of traffic . . . and transportation requirements of our patrons."

INDIANAPOLIS RAILWAYS, INC. did a lot better last year than in 1949, according to its 1950 report, issued recently.

It shows a net operating loss of $15,548.44 for 1950, which was in favorable contrast to a net operating loss of $466,787.77 for 1949.

In addition the report revealed that since December, 1950, the number of passengers riding transit vehicles has been on the increase. The vehicle carried 12.98 per cent fewer passengers for 1950 than in 1949, but managed as a result of rate increases to raise 1950 revenue $26,218.38 over 1949.

Most credit for the optimistic financial outlook goes to the improvement of operating efficiency. Some $450,033.10 was saved last year over 1949 although the report, over the signature of W. Marshall Dale, company president, indicated further large savings, do not appear possible in 1951 without a reduction in service.

Pay roll expenses were down in 1950, over 1949, although wages were up slightly. With an average of 1,467 employees in 1950 as against an average of 1,604 employees in 1949, the company paid out in wages $205,899.85 less.

LOS ANGELES TRANSIT LINES blames home television for a considerable reduction in 1950 earnings, says E. C. Houghton, president.

Mr. Houghton cited two other major reasons for the drop in income—the rapid increase in automobile ownership and the spread of the five-day week.

"The continuing downtrend in patronage, increases in wages and other operational costs, the process of obtaining rate adjustments after increased costs were imposed, and the changing picture with respect to supplies when the tempo of defense activities increased," were also cited by the head of the transit line.

Despite all the problems, LATL reported a total 1950 income of $22,107,405, and a net of $561,845, or 51 cents a share. Expenses were listed at $21,545,559. Passenger revenues decreased from $24,479,039 in 1949 to $21,778,937 last year.

NATIONAL CITY LINES, INC., last year earned 22.9 per cent on its investment in St. Louis Public Service Co. it is shown by NCL's annual report.

The Chicago transit holding company owns 678,469 shares of Public Service Co. stock on which it received a total of $339,234 in dividends at the rate of 50 cents per share.

PACIFIC ELECTRIC RAILWAY CO. recently handed checks amounting to $175,000 to the City of Los Angeles to cover cost of removing 13.67 miles of track and repaving city streets where rail service termination was recently authorized.

T. L. Wagenbach, general manager of the company presented the checks and a bill of sale giving the city title to the trackage to the city treasurer, in compliance with the terms of the city franchise under which PE operates.

Wide World Photo

A DECK-AND-A-HALF German bus with a 60-passenger capacity was exhibited at the recent International Automobile Show in Frankfurt. It's made in three, four or five-ton classes, with either a gasoline or a diesel engine.

PROVINCIAL TRANSPORT CO., Montreal, issued an annual report that showed the company to be in robust condition.

Net profit for the year was $539,455, or $1.54 per share. It compared with $411,640, or $1.18 in the previous year. Passenger revenues advanced to $11,354,250 from the previous year's $10,252,107, while other operating revenue was higher at $174,275 against $152,666. Total revenue from operations reached an all-time peak of $11,528,525, an increase of $1,123,752 over the 1949 figure, and net results were also at record level. After dividend payments of 90 cents a share, as against 60 cents in 1949, there remained a surplus for the year of $224,455.

Costs of labor and materials again reached higher levels, and more miles were operated, resulting in an increase in total operating expenses of $827,529 to $9,248,149. Operating income, however, increased by $296,222 to $2,280,376. After depreciation charges of $1,275,659 (up $65,636) interest charges up $9,145 to $111,039, and adding $28,587 (against $26,382) for other income, net profits before income taxes were up $223,646 at $922,266. Provision for income taxes was up $95,832 to $382,811.

THIRD AVENUE TRANSIT CORP., though it showed a net loss for February and for the first two months of the year, was better off then than it was a year ago.

The February gross was $2,201,282, the net loss $240,861; it compared to $1,906,854 and $512,638 for the same month in 1950. The gross for the first two months of this year was $4,669,365, the net loss $450,038. During the same period of 1950, the gross was $4,019,692, the loss was $959,409.

UNITED TRANSIT CO., Missoula, Mont., a subsidiary of the Intermountain Transportation Co., has been sold to the Missoula Transit Co.

Price of the franchise and physical assets of the company was $15,000. Included in the sale were 14 buses.

TERMINALS AND SHOPS

Augusta, Ga. — Atlantic Greyhound Lines, Inc., last month opened its new terminal at Twelfth and Greene Sts.

The new terminal conforms with the trend of architecture being employed by AGL in southern terminals. It is constructed in Colonial style, features a large fireplace in its dining room.

Eleven buses can load simultaneously under covered platforms on both sides and at the rear of the terminal, and the modern dining room can accommodate 60 persons.

On hand for the open house ceremonies on the terminal's first day of operation were George S. Engle, president of AGL, and F. C. Martel, vice president of the Southern Region of the line.

Mr. Martel "presented" the building to W. D. Jennings, mayor of Augusta, who led the public across the threshold.

James S. Moak is manager of the new terminal.

* * *

Green Bay, Wis. — Northland Greyhound Lines, Inc., recently opened its new North Adams St. terminal in Green Bay.

The building measures 65 by 165 feet—it has an identically-sized loading and parking area—and is located in a former garage and automobile show room. A bright aluminum paneling covers the front of the terminal, which houses waiting room, ticket windows, a baggage room, news stand, tour bureau and cafeteria, run by Greyhound Post Houses, Inc.

A FAMILY AFFAIR was the opening of Northland Greyhound's new Green Bay terminal. Alfred (Bud) Hanson, new to Greyhound's driving staff but an old hand at playing the organ, came over for the occasion. It was his first appearance in a Greyhound uniform.

The interior of the new terminal is painted dark green on the lower half of the waiting room, giving way to a lighter shade toward the ceiling. Terrazzo tile was used to construct the floors, and a sound-absorbent tile on the ceilings.

In addition to Northland Greyhound, the terminal will be used by four other carriers — Green Bay-Wausau Lines, Inc., Cherry Transit Co., Huettl Bus Lines, and the Lake and Bay View Bus Line.

Seventy-two trips are scheduled daily.

At Green Bay for the presentation ceremonies, attended by 10,000 people, was A. N. Brion, president of Northland.

* * *

Stevens Point, Wis. — New Bus terminal, Northland Greyhound Lines, Inc.

Construction

Gulfport, Miss.—Construction has begun on a modern terminal for Teche Greyhound Lines. To be ready for occupancy late this month, the one-story building is being constructed in such a manner that other floors may be added later.

* * *

Tallahassee, Fla.—Modern Coach Co., Albany, Ga., is constructing a new terminal at Tallahassee, to cost about $180,000.

* * *

North Charleston, S. C.—A ticket agency to serve the North Charleston area has been opened jointly by Atlantic Greyhound Lines and Southeastern Stages.

Moves

Vancouver, B. C.—General offices of the B. C. Electric Co.'s Transportation Division have been moved to new premises at Oakridge Transit Center in Vancouver. The company has completed an extension to the administration building which cost about $175,000.

Plans

Columbus, Ga. — Teche Greyhound is joining with Howard Bus Lines at Columbus in planning establishment of a new terminal.

Pittsburgh, Pa.—Five bus companies which use Pittsburgh sidewalks as pick-up points have promised to send "suggestions and comments" on how the problem of crowded sidewalks can best be solved to the city traffic engineer.

They are Lincoln Coach Lines, Noble J. Dick Bus Lines, Bigi Bus Lines, Poskin Bus Lines and the Lenzer Coach Line.

PARTIAL LIST OF CERTIFICATES ISSUED

COMPANY	ROUTE	MILEAGE
ARKANSAS		
Harrison Motor Coach Co. . .	Harrison, Ark., to Mammoth Spring, Ark.	118.0
IOWA		
Algona Bus Lines	Algona, Iowa, to Blue Earth, Minn. . .	46.0
ILLINOIS		
Industrial Bus Lines, Inc. . . .	East St. Louis to the Community of Edgemont	—
LOUISIANA		
Murrell D. Barton	Alexandria to Alexandria Air Force Base	—
MINNESOTA		
Fairmont Transit Co.	Local service—Fairmont	—
MISSISSIPPI		
Continental Trailways	Columbus to Grenada via West Point, Aberdeen, Houston and Calhoun City	118.0
MISSOURI		
Forest Park Bus Line	Ext. West of Oakland to Clayton Avenues	—
Northeastern Missouri Greyhound Lines Inc.	Ext. Perry to Paris, Mo.	20.0
NEW YORK		
Elmira Motor Coach Co. . .	Ext. Hamlet of Bulkhead to Pine City in the town of Southport, Chemung County	—
TENNESSEE		
Airways Bus Lines	Downtown Memphis to 2584th Air Force Training Center	—
WISCONSIN		
Norman L. Schulze	Wisconsin Dells via Camp McCoy to Williams	—

IN THE STATE LEGISLATURES

DELAWARE—A bill authorizing issuance of an additional $3,900,000 in bonds needed to complete the Delaware River Memorial Bridge was given final passage by the Delaware Legislature recently and sent to the governor for signature.

Expected to be given final legislative approval shortly afterward was a related

measure authorizing the State Highway Department to acquire the New Castle-Pennsville ferries.

Cost of the bridge and of acquiring the ferries would not be an expense of the state, but would represent funds supplied by private investors who purchase the revenue bonds issued by the state. The bonds will be paid off through bridge tolls.

OHIO—Over the objections of some of the state's municipalities, the Senate Utilities Commission recently recommended passage of a bill to bring the rates charged by privately-owned transit systems in Ohio cities under the control of the state PUC.

* * *

The Ohio State Senate has approved a House bill which would permit the operation of interurban three-axle buses 40 feet in length.

LEGAL DECISIONS

KENTUCKY — Kentucky's Court of Appeals has approved consolidation of Louisville Railway Co. and Capital Transit Co. of Frankfort.

The plan calls for the two city bus lines to be merged under the name of Louisville Transit Co. through an exchange of stock. By that means the Louisville company's $5,000,000 stock deficit could be wiped out. After that the sponsors of the plan expect to begin paying dividends again on preferred stock.

Consolidation was fought by James J. Donohue and others owning nine per cent of the Louisville company's preferred stock. They claimed the proposed exchange of stock in the Louisville company for that in the new one would work in favor of holders of common stock and against preferred owners.

Reviewing rulings in other cases, Appellate Judge James B. Milliken said the proposal was legal and that "It is obvious that the corporation and all its stockholders will benefit." He said belief to the contrary was "an unwarranted assumption and cannot properly be considered in this procedure."

NEW YORK—A three-share stockholder in the Greyhound Bus Corp. failed in a Federal Court action seeking to make the bus line consider abolishing passenger segregation on Southern routes.

James Peck, of New York, had sought a temporary injunction to bar the May 15 stockholders meeting unless the agenda included this item:

"A recommendation that management consider the advisability of abolishing the segregated seating system in the South."

Federal Judge Sylvester J. Ryan denied Peck's motion.

BUS AND TROLLEY BUS DELIVERIES

Motor Bus Deliveries	Number of Buses	Manufacturer	Model and Type	Seats
Albuquerque Bus Co. (N. M.)	5	GMC	TDH-4509	45
Anoka-Minneapolis Bus Co. (Minn.)	1	Fitzjohn	Cityliner	35
The Arrow Line (Conn.)	1	GMC	PD-4103	41
Athens City Lines (Ga.)	1	Marmon-Herrington	8M2BB	32
F. Atkinson (Cal.)	1	GMC	TDH-3612	36
Atlantic Greyhound Corp. (W. Va.)	24	GMC	PD-4103	41
Austin Transit Co., Inc. (Tex.)	9	ACF-Brill	C-11	33
Baltimore Transit (Md.)	5	GMC	TDH-4509	45
Bamford Bros. (Pa.)	1	Fitzjohn	Cityliner	33
Biloxi-Gulfport City Lines, Inc. (Miss.)	2	Fitzjohn	Cityliner	33
The Blue Line (Me.)	1	Flxible	218B1-51-33SU	33
P. Bortner Bus Line (Pa.)	1	GMC	PD-4103	41
Bowling Green-Hopkinsville Bus (Ky.)	1	Flxible	218B1-51-33SU	33
Brentwood Motor Coach Co. (Pa.)	2	Fitzjohn	Cityliner	35
Campus Travel, Inc. (N. Y.)	1	GMC	PD-4103	41
Capitol Greyhound Lines (D. C.)	8	GMC	TDM-4509	45
Caprock Bus Lines (Tex.)	1	Flxible	218B1-51-29IC	29
Carey Transp., Inc. (N. Y.)	6	Flxible	218B1-51-28IC	28
Carolina Coach Co. (N. C.)	11	GMC	PD-4103	41
Central Greyhound of N. Y. (O.)	9	GMC	TDM-4509	45
Central Greyhound Lines (O.)	9	GMC	PD-4103	41
	20	GMC	TDM-4509	45
Chicago Transit Auth. (Ill.)	15	ACF-Brill	C-44	44
Columbus Celina Coach Co. (O.)	3	GMC	TDH-3612	36
Community Bus Lines, Inc. (Me.)	1	Marmon-Herrington	8M2BC	35
Conn. Ry. & Ltg. Co. (Conn.)	5	GMC	TDH-3612	36
Crown Coach Co. (Mo.)	4	GMC	PD-4103	41
Del Rio Motor Co., Inc. (Tex.)	2	ACF-Brill	C-27	27
Deluxe Motor Stages of Ill. (Ill.)	6	GMC	PD-4103	41
N. J. Dick (Pa.)	4	GMC	TDH-3612	36
Dixie Greyhound Lines, Inc. (Tenn.)	5	GMC	PD-4103	41
Dixie Traction Co. (Ky.)	1	Flxible	182B1-51-24IC	24
Druid City Transit, Inc. (Ala.)	1	Southern	S-36	36
East Taunton Bus Line Corp. (Mass.)	2	Fitzjohn	Cityliner	34
Erie Coach Co. (Pa.)	1	Beaver	B 35 PT	35
Florida Greyhound Lines (Fla.)	5	GMC	TDM-4509	45
City of Gardena Muni. Bus Lines (Cal.)	1	GMC	TDH-3612	36
Grand Island Transit Corp. (N. Y.)	2	Flxible	218B7-51-37SU	37
Hendrick Hudson Bus Lines (N. Y.)	1	Beaver	B 35 PT	37
L. C. Herman (O)	1	Flxible	218B7-51-37SU	37
Hill Top Bus Lines (Pa.)	1	Fitzjohn	Cityliner	33
Hudson Bus Lines (Mass.)	1	Flxible	218B7-51-29IC	29
Indiana Motor Bus (Ind.)	2	Flxible	218B1-51-29IC	29
Jordan Bus Co. (Okla.)	2	Flxible	218B1-51-29IC	29
Kentucky Bus Lines (Ky.)	2	GMC	PD-4103	41
Lincoln Coach Lines (Pa.)	2	Flxible	218B7-51-37SU	37
Manhattan Coach Lines, Inc. (N. J.)	2	ACF-Brill	C-44	45
McKeesport Transit Co., Inc. (Pa.)	1	Fitzjohn	Cityliner	35
Michigan City Transit Lines (Ind.)	1	Marmon-Herrington	8M2BA	32
New England Trailways, Inc. (Conn.)	10	GMC	PD-4103	41
New Haven & Shore Line Ry. Co. (Conn.)	1	Beaver	B 35 PT	37
N. J.-N. Y. Transit Co., Inc. (N. J.)	10	ACF-Brill	C-44	45
New Mexico Transp. Co. (N. M.)	4	GMC	PD-4103	41
N. Y. C. Bd. of Transp. (N. Y.)	44	Mack	C-50D	49
North Star Ind. Corp. (Mich.)	2	GMC	PD-4103	41
Okanogan Valley Bus Line (Wash.)	1	Flxible	218B1-51-29IC	29
Oriole Motor Coach Co. (Pa.)	1	Beaver	B 35 PT	37
Overlake Transit Svc. (Wash.)	2	Marmon-Herrington	8 M 2 BC	35
Pacific Greyhound Lines (Cal.)	5	GMC	PD-4103	41
Pekin Muni. Bus Line (Ill.)	2	Marmon-Herrington	8MBA	27
Pennsylvania Greyhound Lines (O.)	2	GMC	PD-4103	41
Peter Pan Bus Lines (Mass.)	3	GMC	PD-4103	41
Peterson's Garage & Auto Co. (Tex.)	8	Beck	B-29	33
Pickett Svc. Co. (Va.)	2	Flxible	218B7-51-37SU	37
Pioneer Bus Co. (Tex.)	5	ACF-Brill	C-31	33
Pittsburgh & Weirton Bus Co. (W. Va.)	3	GMC	TDH-3612	36
Pittsfield Yellow Cab Co. (Mass.)	1	Flxible	218B1-51-33IC	33
Queen City Coach Co. (N. C.)	11	GMC	PD-4103	44
Richmond Greyhound Lines, Inc. (Va.)	4	GMC	PD-4103	41
St. Louis Public Svc. Co. (Mo.)	83	GMC	TDH-5103	51
City of St. Petersburg (Fla.)	4	Marmon-Herrington	8M2BA	33
Savannah Transit Co. (Ga.)	10	GMC	TDH-3612	36
Service Coach Lines, Inc. (Ga.)	5	GMC	PD-4103	41
Shafer Coach Lines, Inc. (Pa.)	6	ACF-Brill	C-31	36
Smoky Mountain Stages (N. C.)	3	GMC	PD-4103	41
Southeastern Stages, Inc. (Ga.)	6	GMC	PD-4103	41
Southern Stages (Ga.)	5	Aerocoach	372MCA	37
Southwestern Greyhound Lines (Tex.)	26	GMC	PD-4103	41
Springfield City Lines (O)	10	Marmon-Herrington	8M2BA	31
Suffolk City Transit (Va.)	1	Fitzjohn	Cityliner	27
Swallow Coach Lines, Inc. (Ill.)	3	GMC	PD-4103	41
Syracuse & Oswego M. L., Inc. (N. Y.)	2	Flxible	218B7-51-37SU	37
Transcontinental Bus Sys. (Tex.)	17	GMC	PD-4103	41
Union Bus Lines (Tex.)	6	Aerocoach	372MCA	37
Union St. Ry. Co. (Mass.)	5	GMC	TDH-4509	45
United Transit Co. (Tenn.)	30	GMC	TDH-4509	45
Valley Coaches, Inc. (Ga.)	4	GMC	TDH-3612	36
Vermont Transit, Inc. (Vt.)	4	Flxible	218B1-51-29IC	29
W & W Bus Co. (N. J.)	1	Marmon-Herrington	8MBC	29
West Side Transit (Pa.)	2	GMC	TDH-3612	36
W. Va. Transportation Co. (W. Va.)	2	Flxible	218B7-51-37SU	37
Westwood Transp. Co. (N. J.)	6	ACF-Brill	C-44	45
White Transit Co. (Pa.)	2	GMC	TDH-3612	36
Wylly's Tours (Fla.)	1	Beck	Skyliner	41
Miscellaneous Deliveries				
Dept. of the Army-Ord. Dept. (Mich.)	10	ACF-Brill	C-36-M	37
Dept. of Correction (Cal.)	1	Flxible	218DWX1-51-33SU	33
Duquesne Univ. (Pa.)	1	Flxible	29B1-50-29IC	29
Ord. Tank Automotive Ctr. (Mich.)	10	GMC	TDH-3612	36
Texarkana Indust. Sch. Dist. (Tex.)	1	Flxible	218B1-51-33SU	33
U. S. Govt. (D. C.)	18	Southern	S-36M	37
Foreign Deliveries				
Gray Coach Lines, Ltd. (Can.)	10	GMC	PD-4103	41
Highland Lines, Ltd. (Can.)	4	Flxible	218B7-51-33SU	33
Mes.-Aguascalientes-Durango (Mex.)	2	Flxible	218DWX1-51-28IC	28
	1	Flxible	218B1-51-29IC	29
Omn. de Santa Clara, S. A. (Cuba)	11	Fitzjohn	Cityliner	33
SMT (Eastern) Ltd. (Can.)	3	GMC	TDH-3612	36
Trolley Bus Deliveries				
Chicago Transit Auth. (Ill.)	2	Marmon-Herrington	TC-49	49

TOTAL APRIL DELIVERIES REPORTED IN THIS ISSUE ..... 612 Buses, 2 Trolley Buses

TOTAL 1951 DELIVERIES REPORTED TO DATE ..... 2,080 Buses, 49 Trolley Buses

NOTE: This list is based on monthly reports from manufacturers. Not all manufacturers report regularly, consequently, this list is not to be considered complete.

Cut maintenance time and costs with help of Exide BATTERIES

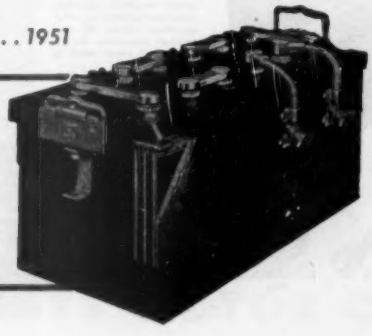
Exide Batteries are built to give *exceptional service* . . . to withstand *hard service* . . . to deliver *economical service*. They're helping to keep buses out of the shop and on the road . . . on short-haul and long-haul lines . . . in gas and Diesel-powered coaches. That's why so many bus lines equip with Exide. Owners and maintenance personnel know they can count on Exide Batteries for dependable performance, long life, ease of maintenance, low cost per mile of operation, plus other qualities that make Exide the best bus battery buy at any price.

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto
"Exide" *Reg. Trade-mark U. S. Pat. Off.*

1888 . . . DEPENDABLE BATTERIES FOR 63 YEARS . . . 1951

Service-proved features that make Exide outstanding for bus service—gas or Diesel

- Long-life "LX" plates—proved in service.
- Heavy cell connectors.
- Reinforced hard rubber covers.
- Heavy-duty hard rubber container.
- Treated wood separators with Vitrox retainers.
- Quarter-turn vent plugs for convenient cell inspection.



You'll fare best

with the

Ohmer
LOCK-O-MATIC

AUTOMATIC COIN RECORDING *PLUS* LOCKED VAULT SECURITY

If you are now using ordinary lock boxes, the Ohmer Lock-O-Matic will fit right into your transit operation without change in basic system. With Lock-O-Matics you'll gain control over all revenue at the source. The totals in dollars and cents and tokens as shown on the machine's registering counters must be accounted for when the locked vault is emptied by your auditing department.

Ohmer Lock-O-Matics are sturdily built to stand up under wear, vibration and an above-the-ordinary amount of abuse. They will give you a long, useful and money saving life in return for a very nominal initial investment.

AUTOMATICALLY SORTS AND REGISTERS SIX DENOMINATIONS OF COINS AND TOKENS
A HEAD FOR FIGURES
The business brain of the Lock-O-Matic consists of three sets of totalizing counters. These make a record of all fares paid. Coins add accumulatively into a cash counter in dollars and cents total value. Tokens add into separate counters in units.
Write for New Folder
ROCKWELL

LIKE MONEY IN THE BANK!

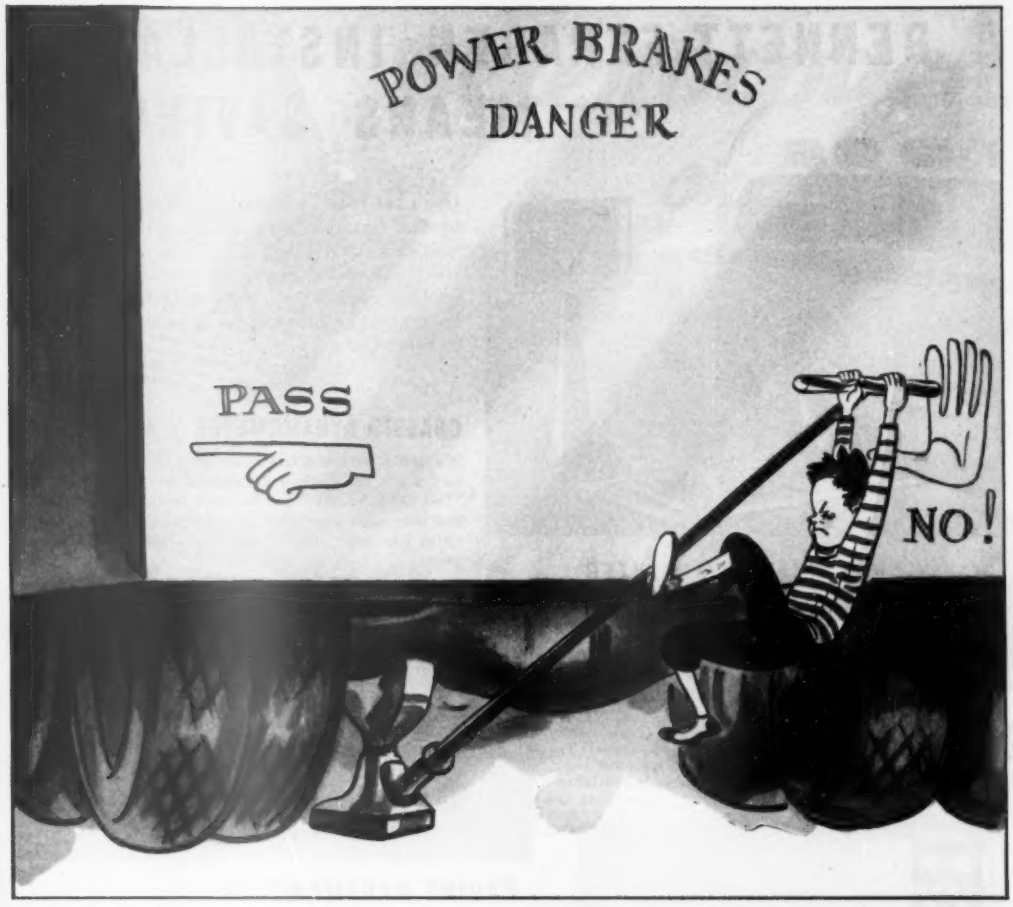
Ohmer Lock-O-Matics have the safest money vault ever built. The dual key system is virtually tamper-proof. Electric cut-off makes machine inoperative until vault is locked shut in machine against positive cams. A detector counter adds one each time vault is removed.

AUDITOR'S KEY — BOX PULLER'S KEY

A FULLY GUARANTEED PRODUCT OF
ROCKWELL MANUFACTURING COMPANY

Nationally distributed by **JOHN D. McGUIGAN, INC.**

616 S. MICHIGAN AVE. CHICAGO 5, ILL.



Don't send a boy to do a man's job!

MOTOR OIL that may—or may not—stand up to man-sized jobs just isn't worth the risk today. So—why not standardize on this man-sized oil—Phillips *66* Heavy Duty Motor Oil.

Manufacturing care all along the line assures you that Phillips *66* Heavy Duty Motor Oil can take those tough assignments in stride. High speeds! High temperatures! Heavy loads!

Great stamina—at low cost per unit of work is why Phillips *66* Heavy Duty Motor Oils are used on 10,000,000 fleet service miles a week.

Ask one of our on-the-job lubrication engineers how you can add efficiency and economy to your fleet with Phillips *66* Heavy Duty lubricants. Phillips Petroleum Company, Bartlesville, Oklahoma.

Oil for the Engines of Commerce

PHILLIPS 66 HEAVY DUTY MOTOR OIL

A BENNETT-FERAGEN INSTALLATION MEANS SAVINGS!

Don't let today's mounting costs eat into your profits. Get the facts on equipment that finds trouble before it begins to drain your earnings. Have one of our engineers call—you will then find out what a surprising opportunity there is for you to cut your maintenance and also to save on other costs.

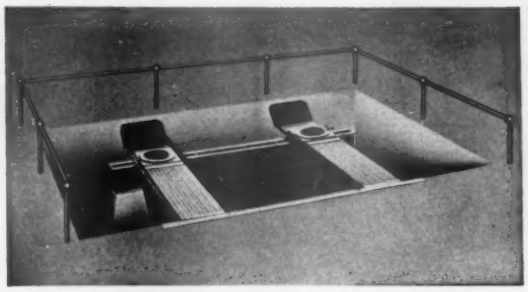
★

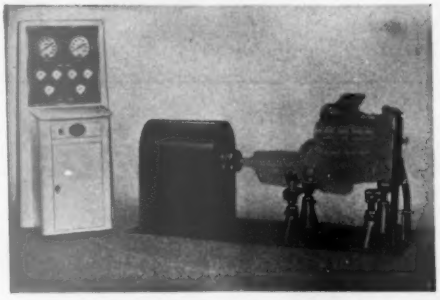
CHASSIS DYNAMOMETER *"Indoor Road"*

Model CDB-78 will test buses at speeds from 80 m.p.h. to 0 m.p.h. and engines developing 300 h.p. and up. The "INDOOR ROAD" can be built to suit any condition and any capacity. One bus fleet covering 5,940,000 miles per year, made a gasoline saving of $8400 per year.

BUS CHASSIS ANALYZER

The BENNETT-FERAGEN heavy duty type (CAP-57) and Super Duty Type (CAP-77) Pit Type Chassis Analyzers provide complete front end service for buses of all makes and sizes. Complete correction equipment furnished with each analyzer permits fast, safe, accurate operation. All units equipped with the famous BENNETT-FERAGEN Turntables and the patented Wheel Aligner designed especially to handle the heaviest buses. An outstanding heavy duty Wheel Balancer is available as a companion piece.



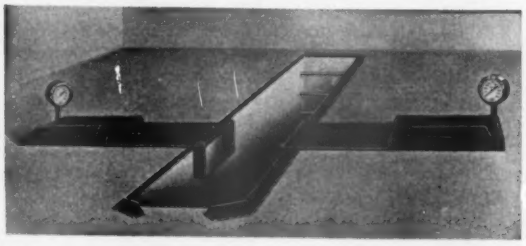


ENGINE DYNAMOMETER

BENNETT-FERAGEN Engine Dynamometers measure power output of any engine under all loads and operating conditions. A true picture of engine efficiency, valve, ignition, and carburetor synchronization throughout the operating range of the engine is reflected in the readings obtained. These Dynamometers are made in a range of sizes and capacities from Fractional H.P. to 10,000 H.P.

BRAKE TESTER

Reveals true condition of your vehicle's Brakes . . . shows braking power of each wheel . . . measures brake torque . . . tests brake equalization . . . indicates inadequate brakes and prevents tire wear. Analyzes brake action through entire operating range. Eliminates road testing. Indicator dials clearly visible from the pit, saving time and effort during adjustment. Several models available.



BENNETT-FERAGEN, INC. *1005 S. LAFAYETTE BLVD.*

WRITE FOR DETAILS SOUTH BEND 18, INDIANA

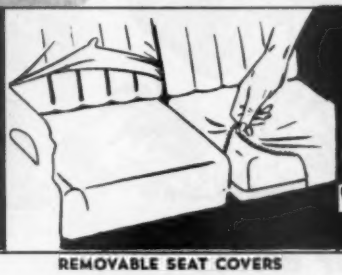
MODEL TR-150

Aerocoach chooses NATIONAL SEATING

better features . . . less maintenance

RECLINE RELEASE

Handy as can be—right under the finger tips. Simple, trouble-free action—quiet, positive, no pinched fingers.



REMOVABLE SEAT COVERS

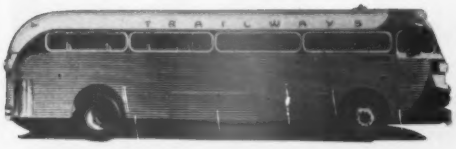
on molded foam rubber cushions—are quickly removed, readily cleaned or replaced if necessary.

NEW RECLINING COMFORT

at your finger tips. Cushion slides forward as back reclines. Compensating spring makes for easy action.

Simply a case of choosing on merit -- backed up by favorable experience with National Seats.

Check for a moment some of the qualities that you find in a good seat. Appearance -- comfort -- strength -- quality throughout -- minimum maintenance. Nationals rate high on all these points -- high enough, incidentally, to get the business from shrewd buyers.



Every operator wants the kind of seats that keep riders happy and maintenance departments out of work. Note the clean lines, removable seat covers, recline control at finger tips, and other features. Wise operators are getting specifications on National Seats. Glad to get this information to you, too, if you don't already have it!

For the better ride longer - - - specify Nationals!

National SEATING COMPANY

Take a "BIG BITE" out of belt costs

Put "teeth" in your drives with DAYTON COG-BELTS*

Dayton Cog-Belts consistently deliver more service-miles for fleets on all types of automotive belt drives. For example—*Fan-belt drives*—a large transit company reports an average increase of 15,000 more miles per belt with Dayton Cogs, over the life of ordinary belts!

Compressor drives—operator of a school bus fleet reports 21,964 *extra* service-miles on a run where premium quality Dayton Cog-Belts replaced an ordinary V-Belt compressor drive!

On automotive drives of every kind, Dayton Cog-Belts outperform ordinary belts consistently by a wide margin. The Cog-Belt is scientifically built to bend (like the joints of a finger) as the belt goes around the pulleys. Space between the cogs of the belt takes up compression, gives increased flexibility, longer belt life.

THE DAYTON RUBBER COMPANY
DAYTON 1, OHIO

Now—new anti-freeze Radiator Hose!

Here is the first hose specifically compounded to resist the corrosive bite of a boiling mixture of water, anti-freeze chemicals, rust, etc. Earns its cost in saved anti-freeze alone!

Team the automotive Cog-Belt with Dayton's new anti-freeze-resistant Radiator Hose for a money-saving program of cooling system maintenance. Ask your Dayton Jobber about Dayton's complete fleet program or write us.

Cog-Belts and Radiator Hose by

Dayton Rubber

*T.M.

WORLD'S LARGEST MANUFACTURER OF V-BELTS

"Outstanding Efficiency"

Says Supt. J. W. HUDSON

J. W. Hudson is Superintendent of Equipment for the Charleston Transit Company, 3-time winner of *Bus Transportation's* Maintenance Award.

As an authority on how to "keep 'em rolling," Mr. Hudson's opinions are of value to all operators of trucks and buses.

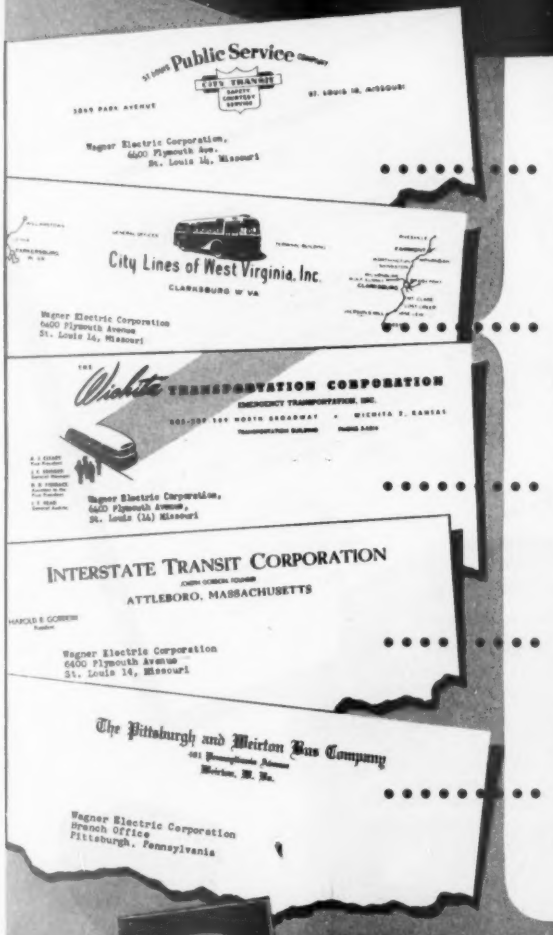
Mr. Hudson's letter to AC is reproduced on this page. Note particularly his endorsement of the outstanding efficiency of AC Spark Plugs—and his enthusiasm for *CORALOX*, AC's patented Insulator. There is an AC Commercial Type Plug, with patented *CORALOX* Insulator, engineered for *your* engine—to give you the day-in-and-day-out efficiency enjoyed by the Charleston Transit Company.

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

AC
SPARK PLUGS
Charleston Transit Company
A C Spark Plug Co.
Flint, Michigan
November 22, 1950
Gentlemen:
We have been using A C Spark Plugs in our fleet of gas buses for several years.
They have proven highly satisfactory in all circumstances, which our buses encounter daily.
We have had unusually good results with your new Coralox insulators.
The outstanding efficiency of A C Spark Plugs has contributed to the successful operation of our fleet of gas buses.
Very truly yours
J. W. Hudson
Supt. of Equip.
JWH:vew
CHARLESTON
CHARLESTON TRANSIT

The Rotary Air Compressor makes *Wagner Air Brakes*

THE CHOICE OF THESE BUS FLEET OPERATORS



here's what they say...

"85% of our fleet of more than 1200 buses is equipped with Wagner Air Brakes. Our experience has proved that the rotary compressors used on Wagner Air Brake Systems are comparatively trouble-free. They operate efficiently for long periods of time without servicing, and when they do require overhauling, the cost of time, labor and replacement parts is far below that required in the reconditioning of other types of compressors."

ST. LOUIS PUBLIC SERVICE COMPANY

* * *

"Our fleet of A. C. F. Brill Coaches is 100% equipped with Wagner Air Compressors. We have found the Wagner Air Compressor unfailingly supplies ample air to assure safe stopping at all times and under all conditions, while requiring little or no maintenance or attention. Then, too, the smooth, quiet operation of these compressors adds much to the comfort of our passengers."

CITY LINES OF WEST VIRGINIA, INC.

* * *

"Already our Wagner compressors have operated 35% more mileage than other types without overhauling and there is no indication that overhauling is immediately apparent or even necessary. Our operation with these compressors, since arrival on the property, has been absolutely trouble-free."

THE WICHITA TRANSPORTATION CORPORATION

* * *

"In the past two years each unit we operate has traveled over 100,000 miles and the air compressor maintenance costs have not been more than $1.50 for the six buses we operate."

INTERSTATE TRANSIT CORPORATION

* * *

"Our choice of Wagner Air Brakes has been more than justified by their low cost of maintenance—they are an important factor of economy in our operation. Add to this their easy installation, quiet operation, and absence of carbon in the brake lines, and you can readily see why we endorse the Wagner Rotary Compressor."

THE PITTSBURGH & WEIRTON BUS CO.

Everyone responsible for the safe, economical operation of passenger buses should have Wagner Bulletin KU-201. A request will bring your copy by return mail.

Wagner Electric Corporation

6361 Plymouth Ave., St. Louis 14, Mo., U. S. A.

LOCKHEED HYDRAULIC BRAKE PARTS and FLUID... Robot... Cowl BRAKE LINING... AIR BRAKES... TACHOGRAPHS... ELECTRIC MOTORS... TRANSFORMERS... INDUSTRIAL BRAKES

The presence of a Clark axle under a bus, truck or tractor—farm or industrial—is always a good selling point of the vehicle. It is convincing evidence that the manufacturer believes in fine quality and insists on getting it.
Many quality-minded equipment builders like to Work with Clark.
CLARK
SEE NEXT PAGE FOR MORE ABOUT CLARK PRODUCTS

CLARK EQUIPMENT COMPANY, Buchanan, Michigan

Other Plants: BATTLE CREEK, JACKSON, MICHIGAN

See MANPOWER DELIVER MORE POWER by means of CLARK YARDLIFTS

YOU'LL MAKE THE MOST OF MANPOWER

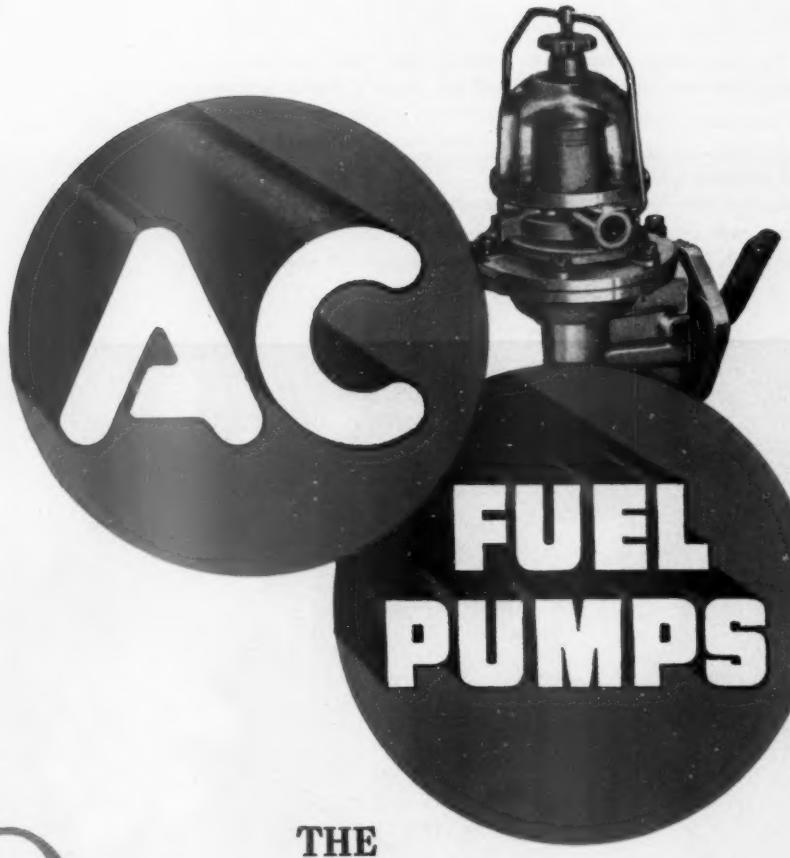
BY MAKING MAN-POWER MORE PRODUCTIVE through use of Clark Yardlift fork trucks—pneumatic-tired huskies designed especially for outdoor handling of heavy, bulky loads. Fast, easy to maneuver and safe, these machines possess amazing stability in operation over rough surfaces. Three capacities—2,000, 4,000 and 6,000 pounds.

CLARK ELECTRIC AND GAS POWERED **FORK TRUCKS**
AND POWERED HAND TRUCKS • INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 17, MICH.
Please send: ☐ Material Handling News ☐ Condensed Catalog
Name _____
Firm Name _____
Street _____
City _____ Zone ____ State _____
DISTRIBUTED THROUGH INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

The field of Materials Handling offers Industry its richest opportunities for increased productive capacity, improved efficiency, better employee relations—and substantial cash savings . . . And the ideal tools with which to achieve those benefits are the Clark Yardlifts and other machines and special devices that constitute the *Leadership Line*.

PRODUCTS OF CLARK—TRANSMISSIONS • FORK TRUCKS & TRACTORS • AXLE HOUSINGS • GEARS AND FORGINGS • RAILWAY CAR TRUCKS • ELECTRIC STEEL CASTINGS • AXLES • TRACTOR UNITS



THE

Original Fuel Pumps

There Are NONE Better

★ More than 40,000,000 in use.
★ More than 100,000,000 built.
★ Backed by 24 years of "know-how."

AC SPARK PLUG DIVISION ‡ GENERAL MOTORS CORPORATION

America's
FIRST *and* FINEST FUEL PUMPS

CLARENCE H. ZERN, *Owner,*
C. H. Zern Transportation, Gilbertsville, Pa.,
prepares for his favorite hobby—hunting.

"I ALWAYS THOUGHT that if any automotive company wanted a tough test for their equipment they should try it out on a fleet of heavy-duty trailer trucks—like the 37 in our employ.

"Our trucks have to maintain a definite schedule on both short and long distance trips and operate in all kinds of weather, with temperatures down to sub-zero—rugged test for men and equipment.

"Batteries take a beating all along the line in our business, and I'm happy to say our Auto-Lite equipped trucks have stood up exceptionally well, and in every instance have more than met the high standards we expect of all our equipment."

AUTO-LITE batteries

THERE IS AN AUTO-LITE BATTERY FOR EVERY USE — CARS • TAXICABS • TRUCKS • BUSES • TRACTORS • DIESEL MOTORS

DON'T MISS THE BUS...

ORDER YOUR Weed Chains EARLY!

● It is earnestly recommended that orders for tire chains be placed at the earliest moment in order to avoid possible shortages later on. It is also recommended that cross chains and repair tools be ordered earlier this year for the same reason. Used chains should be cleaned and examined and any necessary repairs made before they are stored for the summer.

In ordering new chains specify **WEED AMERICAN BAR-REINFORCED**, *the best buy in tire chains.*

ORDER through your Weed Chain Distributor

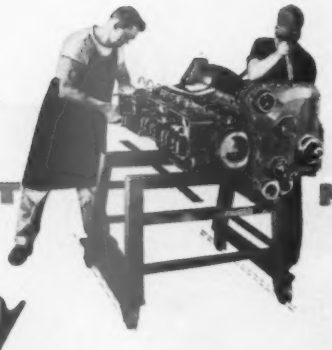
ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

WEED TIRE CHAINS



BUILT NOT ONCE BUT TWICE

Cummins®
CUSTOM BUILT Diesels

Rugged, lightweight, high-speed Cummins Diesels perform better because they're custom-built to *fit each job.* And each engine is actually built twice. Assembled, run-in tested, disassembled, inspected . . . then reassembled and tested *again.* Precision building, Cummins exclusive fuel system . . . efficient service and parts organization, enable users to get peak performance, less "down-time" and *more* rugged, dependable power from Cummins Diesels. *See your Cummins dealer.*

Lightweight High-speed Diesel Engines (60-550 hp) for: on-highway trucks • off-highway trucks • buses • tractors • earthmovers • shovels • cranes • industrial locomotives • air compressors • logging yarders and loaders • drilling rigs • centrifugal pumps • generator sets and power units • work boats and pleasure craft

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA
Export: CUMMINS DIESEL EXPORT CORPORATION • Columbus, Indiana, U.S.A. • Cable: CUMDIEX

Diesel power by CUMMINS

CUMMINS Dependable DIESEL

TRADEMARK REG. U. S. PAT. OFF.

A PARTIAL LIST OF FLXIBLE AIRPORTER OPERATIONS

New York
Carey Transportation, Inc.
80 East 42nd Street

San Francisco
Airport Limousine Company
425 Fourth Street

Chicago
Continental Air Transport Company
300 North Desplaines Street

Pittsburgh
Airlines Transportation Company
111 Scoville Street

Covington
The Dixie Traction Co., Inc.
3rd and Court Streets

Overseas
Pan American World Air Lines
Long Island City, New York

YOU'RE MILES AHEAD AND MONEY AHEAD AND YEARS AHEAD WITH NEW

Flxible VISICOACHES

Where greatest passenger appeal is required

Flxibles are Specified!

Air-Ground Transport service demands top bracket equipment that is **smart** in appearance, inside and out. Airporters must be capable of 'round the clock schedules made through congested streets and on speedways. Dependability is vital!

The Visicoach — with its appealing and restful interior, its air clutch and five-speed Synchromesh transmission, its precision-built body — brilliantly answers these requirements. These are the same reasons why Flxibles are specified again and again by progressive intercity and suburban operators throughout the United States.

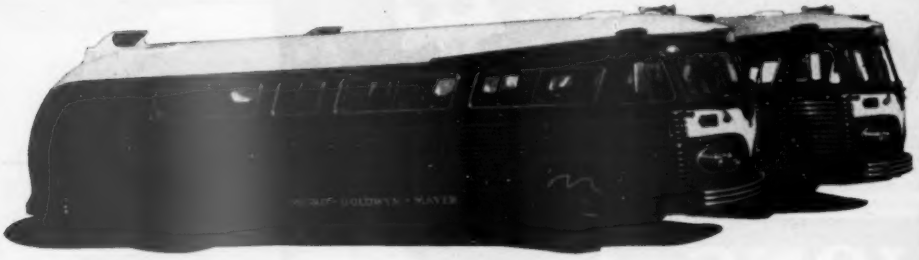
Flxible Visicoaches, in models ranging from 25 to 37 passenger, are available with either gasoline or diesel power. Complete specifications will be sent upon request.

THE FLXIBLE COMPANY • LOUDONVILLE, OHIO, U. S. A.

SASH FOR EVERY TYPE OF TRANSPORTATION—ON LAND, ON THE SEAS, IN THE AIR

DOUBLE FEATURES...

These new Flxible Visicoach models offer *the utmost* in visibility—and maximum safety—because they're equipped with Edwards Emergency Exit Sash.



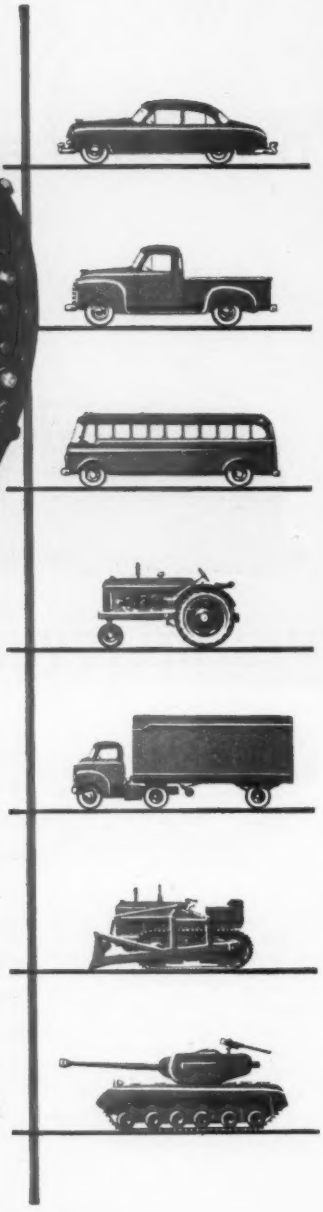
VISIBILITY, SAFETY...

Regardless of the type of bus or service — city, suburban, interurban or cross country — there's an Edwards Sash to fit the requirement exactly. Streamlined construction . . . quick, easy glass replacement . . . less service, lower maintenance . . . rattle-free, weather-tight fit . . . finger-tip opening and closing, and maximum visibility are among the outstanding features of all Edwards Sash. Leading bus builders standardize on it. Profit-minded operators specify it. Write for complete information.

THE O. M. EDWARDS CO., INC., SYRACUSE 4, N.Y.
New York Office — 50 Church St., N.Y. 7, N.Y.

In Canada: O. M. EDWARDS CO. OF CANADA LIMITED
Offices and Plant
335 Laurentian Boulevard, St. Laurent, Montreal 9, P.Q.

EDWARDS SASH



clutches for every type of automotive service

Where smooth power transmission counts most, automotive manufacturers use Long clutches as original equipment.

Since 1921, Long has given capable engineering and manufacturing attention to a wide range of clutch requirements, both civilian and military. We have produced millions of clutch units to equip passenger vehicles, trucks, buses and tractors.

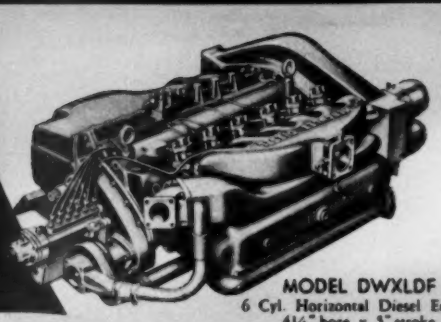
LONG MANUFACTURING DIVISION
Borg-Warner Corporation
DETROIT 12, MICH. and WINDSOR, ONT.

ENGINEERING B-W PRODUCTION

LONG
CLUTCHES • RADIATORS • TORQUE CONVERTERS
OIL COOLERS

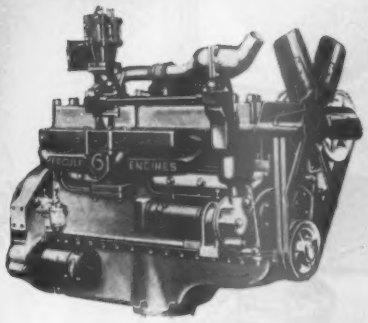
Switch to HERCULES BUS ENGINES

GASOLINE DIESEL



MODEL DWXLDF
6 Cyl. Horizontal Diesel Engine
4¼" bore x 5" stroke
426 cu. in. displacement

for DOUBLE ASSURANCE of LOW OPERATING COSTS!



MODEL TDXB
6 Cyl. Gasoline Engine
4⅜" bore x 5¼" stroke
484 cu. in. displacement

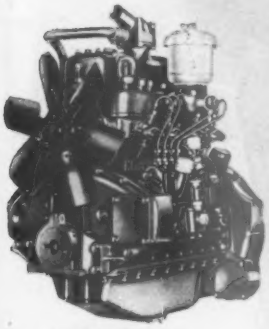
High speed, heavy duty Hercules Engines in both gasoline and Diesel models are available in a wide range of horse power and cu. in. displacements to meet the diversified power needs of the Bus Industry. Built by the world's largest exclusive engine manufacturers, Hercules Engines for bus service reflect the broad experience and the "know how" that can only be acclaimed by specialists. Switch to Hercules with full confidence that they will measure up to the toughest of power assignments the bus industry has to offer.

HERCULES ENGINES 3 TO 500 H. P.

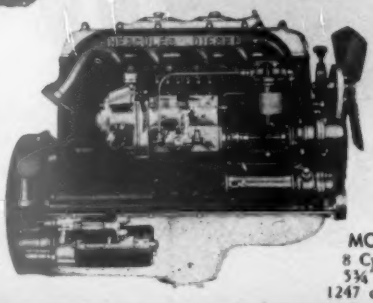
Model	Bore and Stroke	Cu. In. Displ.
DIESEL ENGINES		
Two Cylinder		
DIXC	4" x4½"	113.1
DIXD	4¼"x4½"	127.5
Four Cylinder		
DIX4B	3½"x4"	133
DIX4D	3⅝"x4"	166
DOOB	3⅝"x4½"	198.8
DOOC	4" x4½"	226.2
DOOD	4¼"x4½"	255
Six Cylinder		
DIX6D	3⅝"x4"	249
DJXB	3½"x4½"	260
DJXC	3⅝"x4½"	298
DJXH	3⅝"x4½"	298
DJXHF	3⅝"x4½"	298
DWXC	4" x4⅝"	338
DWXD	4¼"x4⅝"	404
DWXLD	4¼"x5"	426
DWXLDF	4¼"x5"	426
DRXB	4⅜"x5⅛"	474
DRXC	4⅜"x5⅛"	529
DFXB	5" x6"	707

Model	Bore and Stroke	Cu. In. Displ.
DIESEL ENGINES (Cont'd)		
DFXC	5⅛"x6"	779
DFXD	5½"x6"	838
DFXE	5⅝"x6"	895
DFXH	5⅝"x6"	935
DFXHF	5⅝"x6"	935
Eight Cylinder		
DNX V-8C	6" x6"	1348
DNX V-8D	6¼"x6"	1468
DNX V-8DS	6¼"x6"	1468
GAS AND GASOLINE ENGINES		
Two Cylinder		
BXB	2⅜"x3"	39
NXA	3" x4"	56.5
MXB	3¼"x4"	66.3
Four Cylinder		
ZXA	2½"x3"	59
ZXB	2¾"x3"	65
IXA	3" x4"	113
IXB	3½"x4"	133
IXLB	3½"x4½"	141
JX4E	3½"x4½"	164
JX4C	3⅝"x4½"	188

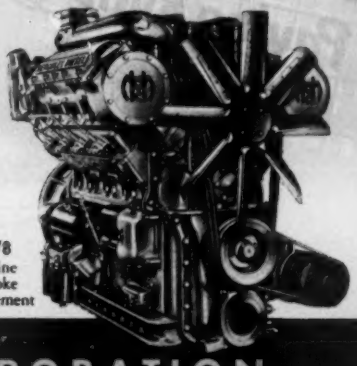
Model	Bore and Stroke	Cu. In. Displ.
GASOLINE ENGINES (Cont'd)		
JX4D	4" x4½"	214
Six Cylinder		
QXA	3½"x4½"	190
QXB	3½"x4½"	205
QXC	3⅝"x4½"	221
QXLD	3-7/16"x4¼"	236.7
JXE	3½"x4½"	248
JXB	3⅝"x4½"	263
JXC	3⅝"x4½"	282
JXD	4" x4½"	320
JXLD	4" x4½"	339
WXC-3	4½"x4½"	383
WXLC	4" x4⅝"	358
WXLC-3	4½"x4⅝"	404
TDXB	4⅜"x5⅛"	474
RXB	4½"x5⅛"	801
RXC	4⅜"x5⅛"	529
RXLC	4⅜"x5⅛"	529
RXLD	4⅜"x5⅛"	558
RXLDH	4⅜"x5⅛"	558
HXB	5" x6"	707
HXC	5⅛"x6"	779
HXD	5⅛"x6"	855
HXE	5⅝"x6"	935



MODEL DIX-4
4 Cyl. Diesel Engine
3⅜" bore x 4" stroke
166 cu. in. displacement



MODEL DRX
6 Cyl. Diesel Engine
4⅜" bore x 5¼" stroke
529 cu in. displacement



MODEL DNX-V8
8 Cyl. Diesel Engine
5¾" bore x 6" stroke
1247 cu. in. displacement

HERCULES MOTORS CORPORATION

Canton, Ohio, U. S. A.

TRANSIT BUSES INC.
More Paying Runs in '51
Transit CCM Buses
Inc.
*MORE BUS PER DOLLAR
4547

*M.B.P.D.

An Honorary Degree Conferred On

Transit Buses

By Operators Throughout the Country

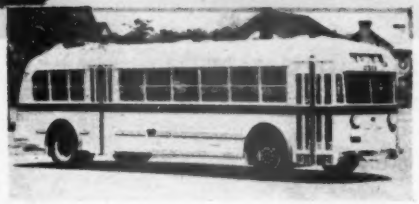
Lower first cost . . . lower operating and maintenance costs . . . that's why Transit Buses have earned the honorary degree of M.B.P.D. (More Bus Per Dollar). Additional features important to the operator are the greater maneuverability, more rapid acceleration and higher availability of Transit Buses. All of which makes possible and profitable the faster schedules and shorter headways that attract additional riders. Write for a copy of new specification brochure.

Transit Buses, Inc.
Subsidiary of
CHECKER CAB MANUFACTURING CORP.

Factory
KALAMAZOO, MICH.

Sales Offices
SCHAEFER RD. at ELMIRA
DETROIT 27, MICH.

INSURED BY MARKEL FOR 15 YEARS



For 15 years the Gloucester Auto Bus Company has operated with an astonishingly low accident rate—thanks to the help of Markel Service. For instance, not one chargeable accident during 1950, in 522,868 miles of operation. Drivers on the Gloucester Bus route are better, safer drivers because Markel Safety Engineers constantly work directly with them. There are monthly Gold Stars awarded to non-accident men and gold pins to drivers whose records show YEARS without accident. Furthermore, Gloucester is happy about the way Markel has reduced accident premiums, and has expeditiously handled the few-and-far-between accidents that have occurred. Whether your line is large or small, MARKEL SERVICE will help and protect you and your public. Investigate today.

MARKEL 10-POINT PLAN

- 24-HOUR ENGINEERING SERVICE ALONG INSURED'S ROUTES
- DAY AND NIGHT CLAIM SERVICE

Effective accident-prevention program at no cost to insured, including:

- SAFETY MEETINGS FOR DRIVER PERSONNEL
- RESEARCH PROGRAM ON SAFETY METHODS AND DEVICES.
- NON-PROFIT WASHINGTON BUREAU FOR ASSURED'S USE
- AWARD SYSTEM FOR SAFE DRIVERS
- LOWER PREMIUMS BASED ON LOSS EXPERIENCE.
- MECHANICAL INSPECTION OF ROLLING STOCK
- HIGHWAY DRIVER-CHECKS BY EXCLUSIVE CAMERA-EQUIPPED PATROL CARS
- TRAFFIC-HAZARD REPORT SERVICE

NO RISK TOO SMALL—FLEET SIZE OR SINGLE UNIT OPERATION

MARKEL SERVICE INC.

Exclusive Underwriters for The American Fidelity & Casualty Company, Inc., the largest stock company specializing in motor carrier coverages

Home Office: RICHMOND, VA.

NEW YORK—90 John St.
BOSTON—Bradway Bldg.
SAN FRANCISCO—130 Bush Street
CHICAGO—134 N. LaSalle St.
LOS ANGELES—1123 Wilshire Blvd.
DALLAS—410 N. Akard St.

Emergencies do happen . . . even to the most careful drivers! That's why every driver, and every operator, should have the extra safeguard of *balanced* brakes.

Different shoes, even in the same brake, do different work, need different kinds of linings. Grey-Rock gives you balanced combinations of friction materials to provide smoother, safer stops . . . with equal wear on all shoes, hence *greater mileage*.

For each unit of your fleet, there's a special combination of Grey-Rock Blocks . . . *balanced* to eliminate dive, grab, hard pedal, and other brake ills. For better brake jobs and lower maintenance costs, order Grey-Rock Blocks from your jobber.

you need

BALANCED BRAKES

Grey-Rock

BALANCED BRAKE BLOCKS

GREY-ROCK DIVISION of Raybestos-Manhattan, Inc., **MANHEIM, PA.**

RAYBESTOS-MANHATTAN, INC., Manufacturers of Brake Linings • Brake Blocks • Clutch Facings
Fan Belts • Radiator Hose • Packings • Mechanical Rubber Products • Rubber Covered Equipment
Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls

ARE BIG BILLS SWALLOWING YOUR PROFITS?

Use Delvac Oils to help keep engines clean, reduce maintenance costs, increase equipment availability.

A dirty engine is a *liability*—cuts deeply into your profits because it requires excessive maintenance, keeps expensive equipment unnecessarily idle. To avoid such troubles, use the oils that help *keep engines clean*—Delvac Oils!

Delvac Oils are ideal for both heavy-duty gasoline and Diesel engines. They have unusually high resistance to oxidation, and are exceptionally detergent and dispersive. They hold formation of harmful deposits to a minimum . . . protect rings, pistons, cylinders and bearings against corrosion and wear . . . assure more available power—*rock-bottom upkeep costs!*

Get more revenue miles—*more profits*—from your engines with Delvac Oils—recommended or approved by 125 engine and equipment builders!

Here's Practical Help for Fleet Operators . . .

Socony-Vacuum gives you . . .

- Help on maintenance problems.
- Individual, tested lubrication schedules.
- Advice on correct application of lubricants, proper handling and storing.
- One source of supply—available everywhere.
- Simplified inventory—with . . .

1. **DELVAC OILS**—for all gasoline and automotive-Diesel engines.
2. **MOBILUBE GX**—multi-purpose gear lubricant for all enclosed gears—manually operated transmissions, transfer cases and drive axles.
3. **MOBILGREASE**—in grades and types for proper lubrication of all chassis parts and engine accessories.

SOCONY-VACUUM

DELVAC OILS

Correct Lubrication for Fleet Operators

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL COMPANY, INC.
MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

picture of a *Star Salesman*

making a call...

You can't have better salesmen than your own buses!

No public transportation salesman's calling card presents greater recognition value, or creates more lasting favorable impression, than clean, good-looking mobile equipment. In terms of dollars *saved* on refinishing and dollars ***earned*** in good-will and increased traffic, Arco Bus Finishes are your most economical, long-term investment. That's because Arco's unique tailored-to-the-job research facilities...which few paint companies are in a position to offer...provide uncommonly durable protective finishes. Give your equipment this extra advantage and you'll make ***every bus a star salesman.***

ARCO PAINTS
Quality... SINCE 1881

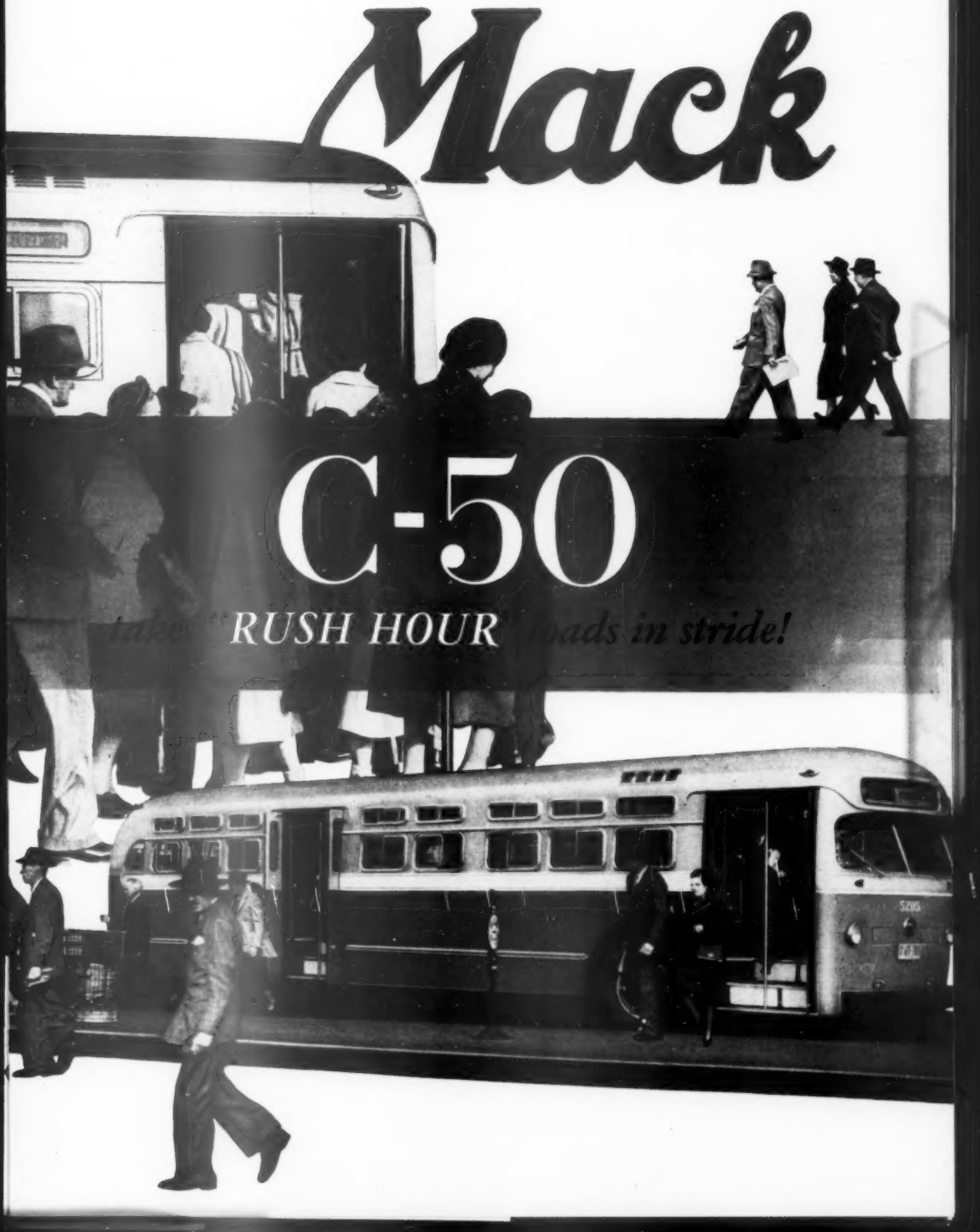
Paints, Lacquers, Varnishes, Enamels, Protective Coatings
TRADE MARK

TESTED FIRST TO *LAST!*

THE ARCO COMPANY, Cleveland 27, Ohio • ARCO COMPANY OF CALIFORNIA, LTD., Los Angeles 1, Calif.

with greater Capacity... Strength... Performance

Mack



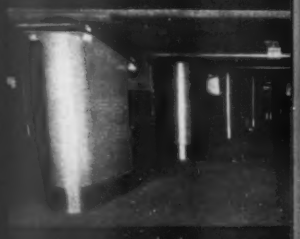
C-50

RUSH HOUR loads in stride!

greater **Mack** C-50 *capacity*

Heavy metropolitan rush hour passenger traffic—plus expanding demands in defense-plant areas—place increasingly exacting peak loads on transit vehicles. The Mack C-50 bus is the modern answer to these conditions. Of 50-passenger rated seating capacity, Mack C-50 can carry as many as 135 passengers when necessary. More passenger and driver safety and comfort are provided, and better facilities for faster passenger interchange. Nearly 40 feet long and available in either 96" or 102" widths, Mack C-50 for all its size and capacity nevertheless possesses startling mobility and amazing performance to maintain dependable schedules over the most congested routes.

Efficient seating arrangements offering either conventional or staggered seats of offset design in the 96" width—or wider aisles in the 102" width—provide more effective standee space with more comfort for seated passengers.

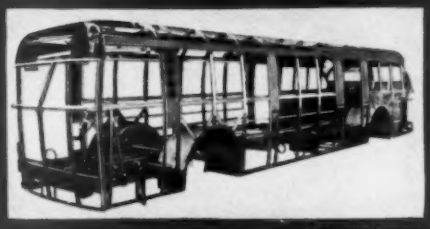


Mack *Eventlow* pressurized fresh air heating and ventilating for temperate climates —*Multiflow* super-ventilation for warm climates—add to passenger comfort. Larger heating core is provided.

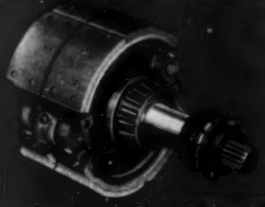
Greater safety. Passenger safety is enhanced by larger brakes—either conventional air or hydraulic-actuated; by stronger structure and running gear. Effortless handling ease through power steering minimizes driver fatigue and helps maintain his efficiency.

greater *Mack* C-50 strength

Ability to stand up under abnormal loads is an outstanding characteristic of the Mack C-50. Not just a stretched-out 45-passenger bus, Mack C-50 is engineered from bumper to bumper to deliver heavy-duty service without undue mechanical stress or strain. Frame, axles, wheels, brakes, transmission, engine—there is extra strength and extra stamina built into every C-50 major component. Long a feature of all Mack buses, this greater durability is more important than ever in times like these.



For years famous as the strongest bus unit-body-and-frame, the Mack Fortress Frame has been made even stronger without excess weight by improved design and manufacture. Built in an improved version of the Mack frame jig, the C-50 frame includes stronger side and roof rails, stronger door and pier posts.



Unusually large braking area of 1088 sq. in. provides maximum operating safety for heavy-duty, start-and-stop congested city service.

Specially designed for center power steering. Heavier beam—larger steering knuckles, kingpins, and axle centers.

Heavier-duty springs—progressive-type in front where load variations are greater—give a comfortable ride with ample vehicle protection when bus is empty or carrying a full load. Rubber Shock Insulators at spring ends eliminate friction and servicing.

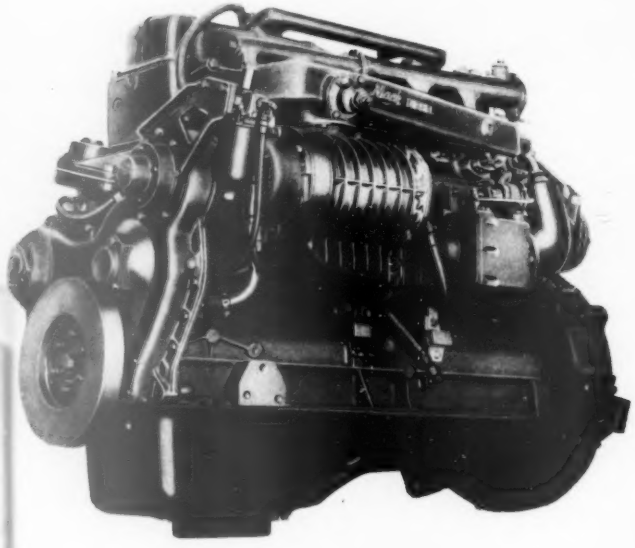
Completely designed to maintain Mack standards for heavier load-carrying and safety factors. Larger gears and carrier. No stretching out of angle drive.

Greater capacity transmission with modified turbine blading to match greater torque of supercharged engine.

Even, clear illumination provided passengers by either incandescent or fluorescent lighting. Riding ease accomplished by combination progressive-type springs with shock absorbers in front, constant-rate springs in rear.

Faster interchange. More rapid receiving and discharging of passengers promoted by efficiently located entrance and exit doors—available in either conventional single-width doors, or double-width doors providing 45-inch clear opening. Internal passenger flow aided by wider effective aisle space and more efficient loading areas.

greater **Mack** C-50 *performance*



Despite its greater capacity and superior strength, Mack C-50 delivers a degree of startling maneuverability and sparkling acceleration unequaled by even much smaller buses. Sharper turning and effortless steering enable Mack C-50 to thread through traffic, negotiate narrow streets and swing difficult corners with amazing ease. Supercharged Mack diesel power provides fast pickup and surging hill-climbing ability unusual among buses of any size. Combined, this extra mobility and power enable Mack C-50 to maintain fast, dependable schedules under today's difficult city traffic conditions.

Turns in shorter circle—with Finger-Tip steering. Higher degree front wheel turning angle—compared to the conventional steering angle of other buses—is made possible through exclusive Mack linkage design. Hydraulically powered center steering gives effortless, finger-tip control—has complete mechanical connections for highest safety factor. These unique steering advantages make Mack C-50 the easiest of all buses to handle.

Improved acceleration and hill-climbing. Performance that is remarkable for a bus of any size is provided by the supercharged Mack diesel engine. Of 672 cu. in. displacement, through supercharging this Mack diesel develops 222 brake horsepower at 2,000 r.p.m. governed speed, with 640 pounds-feet torque at 1,400 r.p.m.—an excellent match for torque converter characteristics. Smooth, quiet and virtually free from smoke and smell, the supercharged Mack diesel attains optimum fuel economy through its ability to operate efficiently on No. 2 Diesel Fuel, which generally costs less than No. 1 and contains more heat units per gallon. Also operates efficiently on No. 1 Diesel Fuel.

...and you get MACK 3-WAY ECONOMY, *too!*

1. [illegible] —More miles per gallon at less cost per gallon.
2. [illegible] —Less service needed—easier to service when needed.
3. [illegible] —Longer life yields better return on your original investment.

modernize with

Mack Manufacturing Corporation
Bus Division
[illegible]

Factory branches and distributors for service and parts in all principal cities. In Canada: Mack Trucks of Canada, Ltd.

Perfect Form is what it
takes to lead the league
in any competition.
Passengers come in all sizes
and shapes and Karpen Seating
has been providing relaxed
comfort to keep them in
perfect form
SEAT 1150

S. KARPEN & BROS. TRANSPORTATION SEATING • *George B. Cross Company* Exclusive Sales Agents

624 South Michigan Avenue, Chicago • One Park Avenue, New York

KARPEN SEATING . . . POINT OF CONTACT BETWEEN THE COMPANY AND ITS PASSENGERS

DON'T LET THIS HAPPEN

TO YOUR DRIVERS

The new C. D. Beck deck and a half

GET THE POWER AND ENDURANCE OF *AIR-PUSH*

AIR-PUSH windshield wipers are becoming standard equipment on more and more buses. Manufacturers have found in them the dependability and power necessary to clean their new, larger windshields.

The new Sprague FLEET-TESTED replacement kit is now available for all makes and models of buses. Lower your wiper maintainance costs by installing AIR-PUSH.

Write for a free copy of our Fleet-Replacement Plan TODAY.

Sprague DEVICES, INC.

Manufacturer of AIR-PUSH *Windshield Wiper*

MICHIGAN CITY, INDIANA

There's a BECK Bus for Every Need
of Intercity and Sightseeing Operation

37 Passenger, Series 5000 Mainliner—Available with Cummins Diesel or International "Gas" power

29 Passenger, Model Beck 29 —Available with Cummins Diesel or International "Gas" power

SKYLINER —in 33-37 or 41 Passenger models —Available with Cummins Diesel or International "Gas" power

Reasonable delivery dates can be offered for these fine, dependable Beck Buses. Demonstrations can be arranged on your own property. Write, wire or phone for complete details and specifications, etc.

C. D. BECK & COMPANY, INC., SIDNEY, OHIO, U.S.A.

Switch to the DELCO LINE

for **equipment protection**

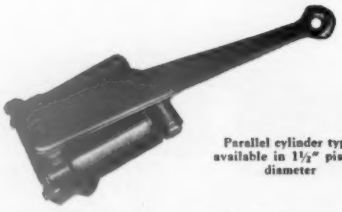
maintenance of schedules

availability of units and parts

ease of replacement

Direct acting type, available in 1", 1⅛", 1¼", 2" and 2½" piston diameters

Opposed cylinder type, available only in 1½" piston diameter



Parallel cylinder type, available in 1½" piston diameter

SHOCK ABSORBERS for ALL cars, trucks and buses

Opposed cylinder type, available in 1⅜" and 2¼" piston diameters

More cars, trucks and buses are equipped with Delco shock absorbers than with any other make. This means that Delco successfully supplies the correct type and size shock absorbers for *every* vehicle—for every vehicle in *your* fleet. If yours are not now Delco-equipped, it will pay you to *switch to the Delco line*. The widespread United Motors organization makes Delco replacement units and parts readily available.

DELCO PRODUCTS

Division of General Motors Corporation, Dayton, Ohio

UNITED SERVICE MOTORS

DELCO SHOCK ABSORBERS—
A UNITED MOTORS LINE
Available Everywhere Through
UNITED MOTORS DISTRIBUTORS

"FRAM Lubri-Graf helps us correct motor trouble before expensive repairs are necessary"

Portsmouth, Va., Shop Foreman, tells how the amazing Fram Lubri-Graf pays off by providing positive checks on engine, oil and filter condition . . .

"The Fram Lubri-Graf makes my work easier, saves us money. Tells the internal condition of the vehicle, enables us to correct motor trouble before it causes expensive repairs. We can use each cartridge longer because the Lubri-Graf tells us when to change . . . eliminating all guess work. I'd recommend the Fram Lubri-Graf to all fleet owners."

Use the Lubri-Graf on your engines and get the same outstanding results. Use Fram Filters and Cartridges for longer, higher performance at lowest clean-oil cost per mile.

There are Fram Filters for every fleet job . . . Fram Cartridges for most every make filter. And only Fram offers you Complete Engine Protection to guard fleet engines at every vital point.

End Cooling System Troubles

New Fram Radiator & Water Cleaner gives *complete* cooling system protection. Softens, inhibits, filters. Stops scale! Stops Rust! Removes Particles! Guards against serious overheating. Two easily installed models to fit all cars, trucks and buses. All Fram Filters are unconditionally guaranteed! See your Fram Jobber.

FRAM
OIL • AIR • FUEL • WATER
FILTERS

Mail Now for FREE Lubri-Graf

FRAM CORPORATION, Dept. B-6, Providence 16, R. I.

Please send me Free Fram Lubri-Graf, and tell me how to get handy clip board.

Name.....

Company.....

Address.....

City.....State.....

No. of vehicles.....

We regularly purchase through.....

.....

.....

they just naturally go together...

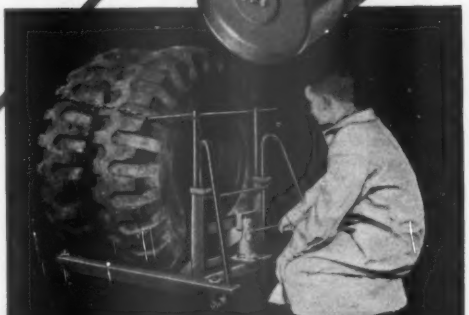
WEAVER LO-HI-DRAULIC JACK has 20,000 lb. capacity

How about putting a "Giant" to work in your shop? And, in addition to a Weaver "Giant" Lo-Hi-Draulic Jack, your shop should have a Weaver Wheel Dolly. They are great time and labor savers.

Model WA-75 "Giant" Jack has 20,000 lb. capacity. It has a saddle low point of 5⅜", and lifts to 24". Exclusive quick lift lever feature permits operator to see as he spots saddle under load.

WEAVER WHEEL DOLLY enables mechanic to handle big dual wheels

Brute strength in a man isn't required when a Weaver Truck and Bus Wheel Dolly is used. This equipment speeds brake, tire and wheel bearing work—or any other job that requires the wheel to be removed. Made in 2 sizes and 3 models. Model WR-31 is illustrated. It has a 2,500 lb. capacity, and handles large single or dual wheels. Lifting arms are raised and lowered by means of power from a built-in hydraulic jack.



WEAVER

Ask your Weaver jobber, or write us for details.

SERVICE SHOP EQUIPMENT

WEAVER MANUFACTURING COMPANY, SPRINGFIELD, ILL.

Twin Post Lifts . . . Unit Lifts . . . Wheel Alignment Equipment . . . Headlight Testers . . . Brake Testers . . . Wheel Balancing Equipment . . . Jacks . . . Dollys . . . and Air Compressors

Wears uniformly...

WAGNER CoMaX BRAKE LINING
requires less frequent adjustments

Take a tip from fleet owners who can speak from experience — you'll get more mileage before relining is necessary when you use Wagner CoMaX Brake Lining. It does not compress under brake pressure or deteriorate with age. It is made of special uniform-textured material with no abrasive elements to score drums.

You can get *complete coverage* in CoMaX sets, rolls, blocks, cut segments or slabs,—and lined shoes — riveted or bonded — all from one dependable source—your Wagner Jobber. You can depend upon Wagner quality because Wagner products are used as original equipment by automobile, truck and trailer manufacturers. Consult your nearest Wagner Jobber, or write us. Ask for Bulletins HU-17 and HU-197 . . . "Tips for Better Brake Service"—free on request.

Wagner Electric Corporation
6461 PLYMOUTH AVE. • ST. LOUIS 14, MO.
(Branches in Principal Cities and in Canada)

TROLLEY COACHES come in RIDING goes up in Halifax Nova Scotia

● Trolley coach rider appeal has worked again. This time in Halifax, Nova Scotia, where Nova Scotia Light and Power Company operates 75 electric trolley coaches.

Back in March, 1949, Halifax became the first city in North America to be served wholly by trolley coaches. Within a few days, riding began to go up . . . 14.5 per cent for the last eight months of 1949. Again in 1950, riding increased. It was 2½ per cent higher than in 1949, 17 per cent higher than the old system operated with motor buses and streetcars.

Originally, Halifax planned to run 65 coaches. But increased riding made it necessary to add six more coaches in 1949, four more in 1950.

In its annual report, Nova Scotia Light and Power Company described the arrival of the trolley coach as the "big event of the bicentennial year." A Halifax newspaper commended the company for "foresight in establishing this fine new system."

And the 100,000 people of Halifax expressed their approval, praised trolley coaches in letters to the company and to the newspapers, supported them in a public opinion survey. But most important of all, they expressed approval where it really counts—by putting more money in the fare box.

ELECTRIC TROLLEY COACHES

Now Serving 56 U. S. and Canadian Cities

Ohio Brass

MANSFIELD OHIO, U. S. A.

LINE MATERIAL AND CAR EQUIPMENT FOR TROLLEY COACHES AND STREETCARS

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont

4160-f

DESTINATOR

Choice of Another Leader

Cincinnati Street Railway Chooses Destinator Signs on 45 new Marmon-Herrington Trolley Coaches

More proof of the increased recognition being given to Destinator advancements in the sign field. When you've installed Destinators on your vehicles:

- waiting passengers at crowded intersections find it easier to read the sharp clear letters printed by the new method used on Destinator Signs.
- operators and maintenance men like the snap-in pivot bearings for quick installation and fast easy removal.

Destinator Signs also include anti-friction bearings which do not require lubrication. Non-perforated copper edging gives you longer curtain life.

There are other important features, too. Our representatives will be glad to tell you about them. Write us today! And when you are specifying new signs for your vehicles, take a cue from these leaders —*CHOOSE DESTINATOR!*

Built for quality, not price ... yet priced competitively.

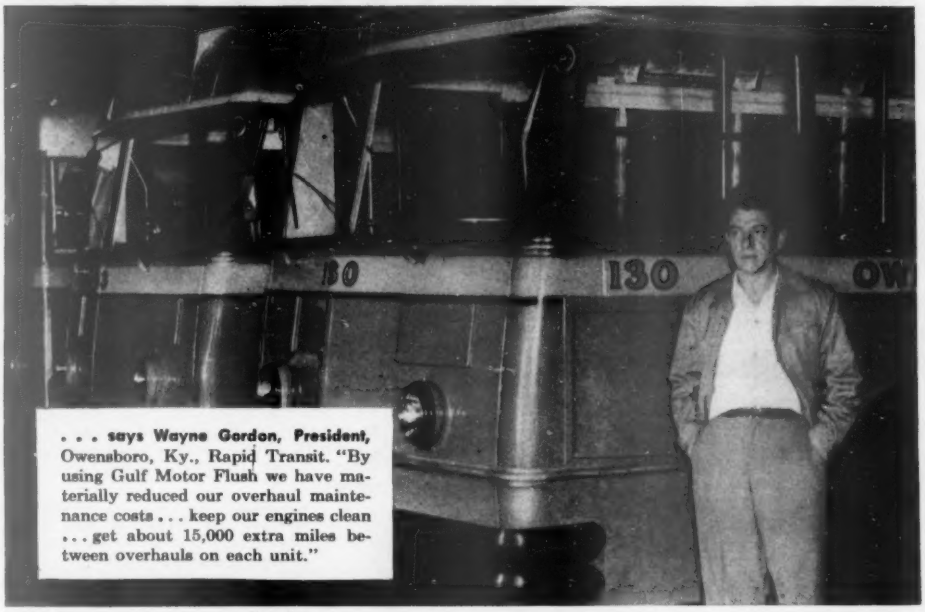
ELECTRIC SERVICE MANUFACTURING CO.

PHILADELPHIA 32, PENNA.

A NATIONAL ORGANIZATION TO RENDER COMPLETE SIGN SERVICE TO THE TRANSIT INDUSTRY

THANKS TO GULF MOTOR FLUSH . . .

"Our overhaul periods have been increased by at least 15,000 miles!"



. . . says Wayne Gordon, President, Owensboro, Ky., Rapid Transit. "By using Gulf Motor Flush we have materially reduced our overhaul maintenance costs . . . keep our engines clean . . . get about 15,000 extra miles between overhauls on each unit."

Fleet operators make big savings, increase availability with Gulf Motor Flush

Evidence piles up every day that unique Gulf Motor Flush is the most satisfactory repair-reducing, engine-cleaning solvent. Users are getting thousands of extra miles of ring life and reduced oil consumption.

Non-corrosive Gulf Motor Flush dissolves harmful motor deposits . . . improves ring action. Without dismantling engines, it removes sludge, varnish, lacquer from rings, valve stems, screens, oil pans . . . gets them clean—leaves engine parts free to perform at top efficiency.

See for yourself how Gulf Motor Flush cuts your repair time and costs, keeps your fleet running better, longer! Arrange for a demonstration on your own equipment. Or write today for your free copy of a brochure which gives complete information on this outstanding maintenance tool.

3 ways Gulf Motor Flush cuts your costs!

1. **Extends engine overhaul periods**
2. **Reduces oil consumption**
3. **Increases availability of equipment**

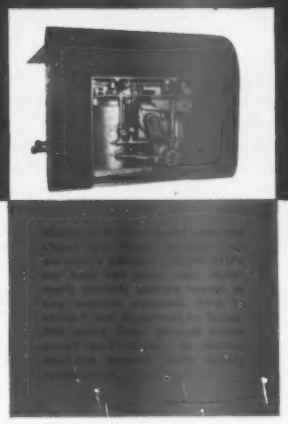
GULF®

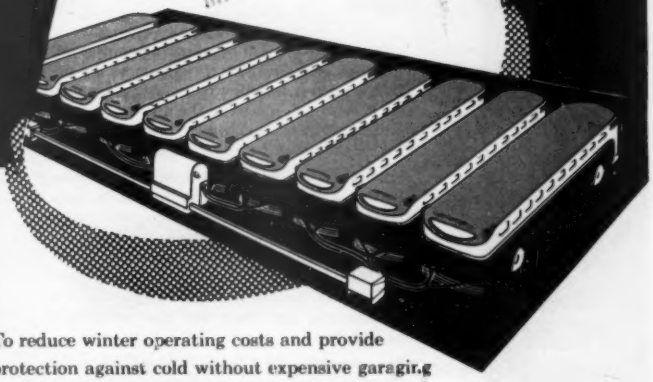
GULF OIL CORPORATION • GULF REFINING COMPANY

722 GULF BUILDING, PITTSBURGH 30, PA.

Now to plan to protect buses from freezing weather

APRIL
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.





To reduce winter operating costs and provide protection against cold without expensive garaging or shelters, many operators have installed the . . .

VAPOR PARKING LOT HEATER

Eliminates the costly delays in getting buses rolling after parking in coldest winter weather. Keeps as many as 10 buses warm with their engines ready to start. Vapor Parking Lot Heaters will prevent wear and tear on engines and the drain on batteries. No need for buying wasteful anti-freeze. With offices throughout the United States and Canada you are assured of reliable service.

WRITE FOR BULLETIN NO. 553

VAPOR HEATING CORPORATION 80 EAST JACKSON BLVD. CHICAGO 4, ILLINOIS

Serving Transportation Industry thru branch offices in New York · St. Paul · Denver · St. Louis · Portland
Washington · Philadelphia · San Francisco · Jacksonville · Richmond · Houston · Montreal · Los Angeles

Allied A P C
American Brakeblok
BALKAMP
Belden
BRIDGEPORT
BRIGGS
BROWN LIPE
CELORON
DETROIT
DITTMER
DUCKWORTH
ECHLIN
FEDERAL
Allied GRAPHO
MARTIN-SENOUR
MicroTest
Modac
Monmouth
New Britain
Allied PRECISION
PURITAN
RARITAN
Allied RAYMOND
Soundmaster
STANDARD
Spicer
Thomson
TRICO
UNITED
Allied WISCONSIN
ZOLLNER

Quality Parts— Quickly Available

IN A NUTSHELL, THAT'S THE BIG REASON WHY

Your NAPA Jobber is a Good Man to Know!

Your NAPA Jobber is more than just another parts jobber. He is part of the nation's largest independent parts organization. And, along with the parts he sells, your NAPA Jobber offers certain undeniable and exclusive advantages *to you.*

For example: NAPA Warehouse Service, backing up your NAPA Jobber's own broad stocks. This vital service puts master stocks of quality parts "right in your own front yard"—no farther away than the nearby NAPA Warehouse. Emergency orders . . . rarely needed parts . . . your NAPA Jobber can get them for you overnight or quicker.

For example: NAPA's "Assurance of Quality" Seal, your assurance of genuine quality in every parts purchase. And this assurance includes a broad range of parts covering the vast majority of your requirements—for cars, trucks and buses of all makes.

For example: The lines your NAPA Jobber stocks are lines you *know.* Many of them are widely used as original equipment. In every case, they are recognized by automotive engineers as meeting the highest standards of quality, performance and service.

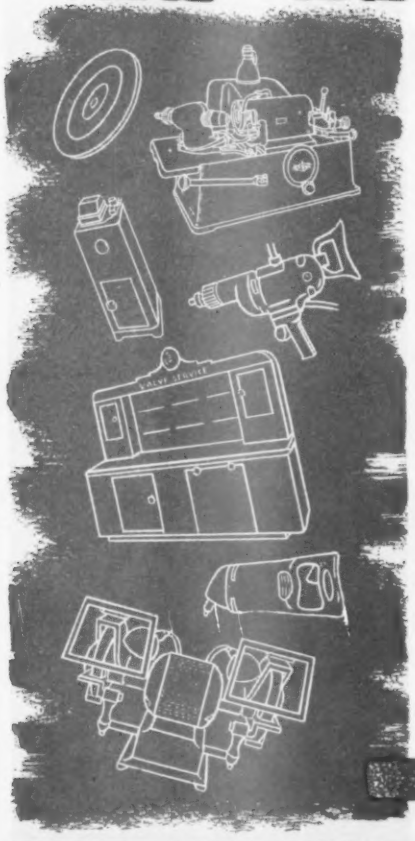
These are but a few of the real and worthwhile advantages that come to you when you do business with your NAPA Jobber. There are many more. And it will pay you to find out about them. Let your NAPA Jobber know the parts requirements of your fleet, if you already haven't done so. Let him prove to you the truth of the statement: "Your NAPA Jobber is a Good Man to Know!"

NATIONAL AUTOMOTIVE PARTS ASSOCIATION • DETROIT 1, MICHIGAN

N·A·P·A *is the largest Independent Parts Organization in the Industry!*

STRETCH MANPOWER!

. . . . . .Get *MORE PRODUCTION* from *EVERY MAN* with **SIOUX** TOOLS



Action picture of SIOUX Perfected Dual Action VALVE SEAT GRINDER. Assures accurate, smooth and fast valve seat grinding.

For that extra capacity you need so much NOW — you need tools that increase the efficiency and productive capacity of your men . . . So go SIOUX all the way.

Sold only through authorized SIOUX Distributors

STANDARD THE WORLD OVER

ALBERTSON & CO., INC. SIOUX CITY, IOWA, U.S.A.

CLASS "A"

DIETZ

SELF-CANCELLING DIRECTION SIGNALS

for

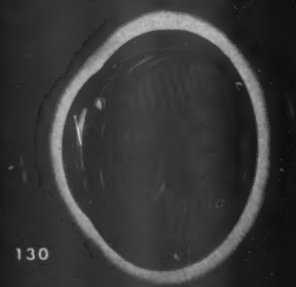
MAXIMUM HIGHWAY SAFETY at MINIMUM OPERATING EXPENSE

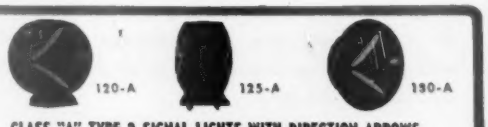
For Safety's sake . . . put the DIETZ new Direction Signal Sets to work on your payload units. Class "A" Type 1 DIETZ Signal Lights (shown at right) are:

No. 120 SINGLE FACE • No. 125 DOUBLE FACE
No. 130 FLUSH MOUNTING

All Lights with either vivid RED or AMBER lenses

The DIETZ Self-Cancelling Direction Signal Switch—No. 111-C—illustrated above—operates at the flick of a finger, then returns to neutral—*Automatically*. Complete with *Flasher* for unmistakable *Signalling*. Easily mounted on all 1½" to 2" diameter steering posts. Non-cancelling type Switches also available. All DIETZ Lights and Switches Tested by Electrical Testing Laboratories. Available from your Jobber now! R. E. DIETZ COMPANY, 225 WILKINSON STREET, SYRACUSE 1, NEW YORK.





CLASS "A" TYPE 2 SIGNAL LIGHTS WITH DIRECTION ARROWS

Outstanding Class "A" Type 2 Direction Signal Lights. Bright AMBER arrows on black backgrounds. Characteristically rugged DIETZ construction.

DIETZ Switches and Lights are available individually or in many popular set combinations. Perfect for new installation and replacement. Class "B" DIETZ Direction Signals for passenger cars and commercial vehicles under 80" wide also available.

OVER A CENTURY OF LIGHTING DIETZ

Gates Coach Belts "Cut Belt Costs in Half —and Save Costly Delays!"

Literally scores of leading transit companies all over the U. S. have found—from their own carefully kept records—that their belt costs have been actually *cut in half* since they began using the Gates Coach Belt. In addition, they report other savings which they consider even *more important.*

The reasons for the outstanding superiority of this belt are quickly told:—

FIRST, The Gates Coach Belt is made of a special, heat-resisting compound that readily withstands the severe heat often created by the excessive operational strains imposed upon rear engines.

AGAIN, oil is a factor that frequently shortens the life of the ordinary belt. The Gates Coach Belt is *Oil-proof!* Finally, because of the heavier loads a rear engine belt must carry, the Gates Coach Belt has been given immensely *greater tensile strength* by building it with high-tenacity RAYON CORDS—and it is also given a tough, multiple-ply cover of more than *double durability.*

Savings Are Even Greater Than Cutting Belt Costs in Half!

As you well know, the failure of a coach belt can cause great mechanical damage by overheating the engine. The result is not only costly repairs but also bad *traffic delays.* The loss of public good-will and patronage resulting from annoying delays is regarded by many companies as being an even more serious loss than a heavy repair bill.

If you want to cut your belt costs and, in addition, avoid the loss of time and of public good-will you incur when a coach belt fails—just drop us a line right now. A Gates Coach belt specialist—working in close cooperation with your local Gates jobber—will come right to your own place and show you how to have the lowest belt costs and the most efficient belt service you have ever enjoyed.

MAKE SURE that the Coach Belt You Get Is Marked with This **TG***

Look for these letters "TG" on the belt itself—as well as on the label—of every belt you buy for rear engine service. "TG" means that the belt has been specially engineered for Coach Rear Engines. You can be sure of getting the belt designed for this more demanding service only by seeing to it that you are delivered belts which bear the letters "TG".

*REG. U. S. PAT. OFF.

Specially Engineered for REAR ENGINES

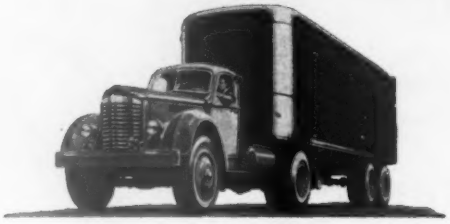
Gates

The Mark of SPECIALIZED Research

The Gates Rubber Company

DENVER, U. S. A.

Move 'em FASTER—
cut costs on every load!

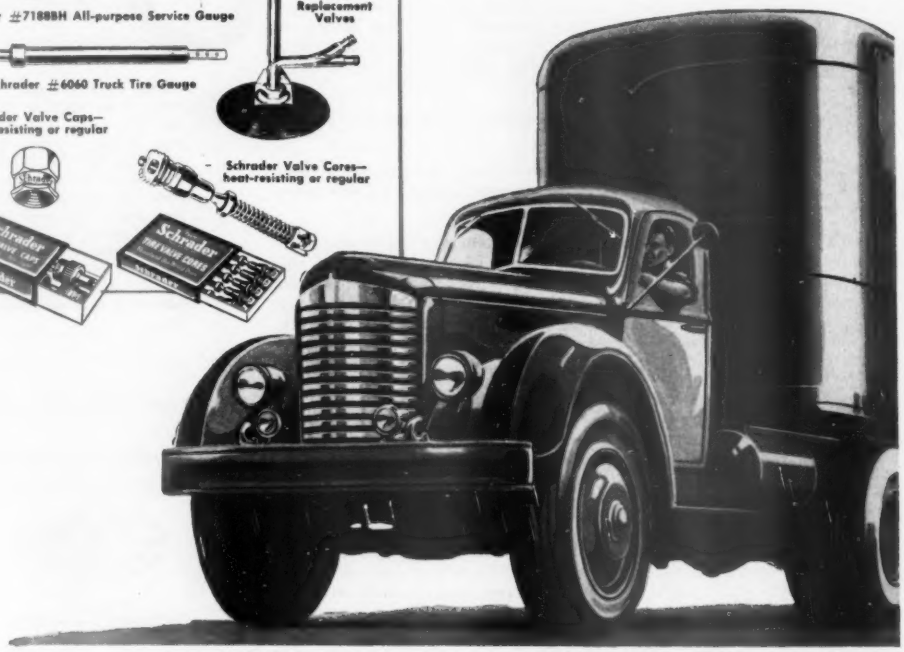


Stalled loads due to roadside flats cost money that regular tire maintenance helps prevent. Accurately gauged air pressure in your tires gives extra miles from vital rubber, moves your vehicles through on time—and helps cut expensive flats.

Put Schrader Products to work for you. Check all your service gauges and inflating devices regularly with a Schrader #8106B Trutest Special. A Schrader #7188BH or a #6060 all-purpose service gauge in each of your vehicles means that *accurate* gauge readings are available wherever your vehicles go. And for all tire valve replacement, caps, cores and service tools—specify Schrader.

A. Schrader's Son, Division of Scovill Manufacturing Company, Incorporated, Brooklyn 17, New York.

Schrader #8106B Trutest Special Gauge
Schrader #7188BH All-purpose Service Gauge
Schrader #6060 Truck Tire Gauge
Truck Replacement Valves
Schrader Valve Caps—heat-resisting or regular
Schrader Valve Cores—heat-resisting or regular

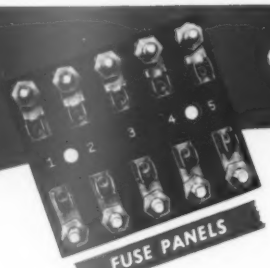


Schrader
REG. U. S. PAT. OFF.

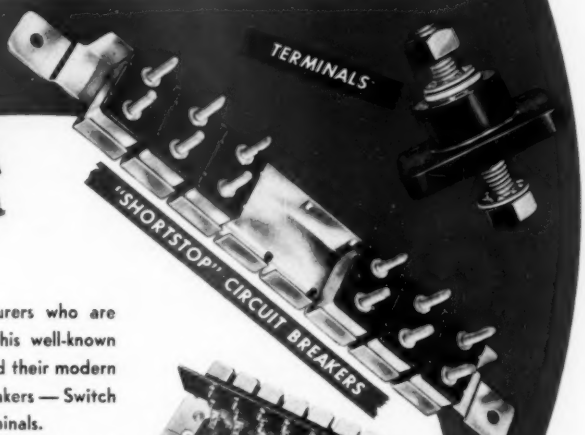
FIRST NAME IN TIRE VALVES
FOR ORIGINAL EQUIPMENT AND REPLACEMENT

ROHDEN MEETS THE HIGHEST STANDARDS OF *Bus Design*

The new TWIN COACH Fageol Liner



FUSE PANELS



SWITCH PANELS

Numbered among the major bus manufacturers who are Rohden customers is the Twin Coach Co. This well-known organization has for the past six years equipped their modern buses with Rohden "Shortstop" Circuit Breakers — Switch and Fuse Panels—Instrument Panels and Terminals.

Rohden supplied the above equipment on over 90% of all buses produced in U.S.A. in 1950.

The extensive usage of Rohden products is indicative of the importance and confidence placed in them. Dependability of the electrical systems in buses over maximum years of operation counts heavily in the savings made in maintenance and replacement costs.

Each Rohden product was designed in keeping with the most modern engineering principles and each has its added value in the matter of ease of installation and durability of construction. We are ready at all times to give full engineering cooperation.

ROHDEN MANUFACTURING CO.

Designers · Engineers

of

- "Shortstop" Circuit Breakers
- Switch and Fuse Panels
- Junction Blocks
- Instrument Panels

4739 MONTROSE AVE. - - - CHICAGO 41, ILL.

L. J. Fageol does it again!

the new

Fageol-Liner

affords a sure means of reducing capital investments and operating costs!

Design and styling is in the best Twin Coach tradition. New anti-collision front body contours reduce turning radius... provide for safer operation.

Presenting for the first time in transit history, a higher quality vehicle at a lower price... produced by utilizing body from Fruehauf's cost-saving mass production facilities, in combination with proven Fageol Twin Coach mechanical components.

Despite inflation... in the face of steadily-rising costs, Twin Coach announces a new line of motor coaches to sell at substantially reduced prices.

Appropriately termed "Fageol-Liners" in honor of their designer, L. J. Fageol, these vehicles establish entirely new motor coach standards. Feature-by-feature, they represent the greatest values in motor coach history.

Fageol-Liners are thoroughbred Twins in every respect... in styling, appointments, fine workmanship... performance. Traditional Twin Coach quality is maintained throughout — nothing has been "cut" on the Fageol-Liner but the price.

A-4124

FAGEOL Twin Coach KENT-OHIO

TWIN COACH COMPANY

KENT, OHIO

a better motor coach...

at a lower price!

Fageol-Liners are available in 30 to 52-passenger urban type models and in several intercity models.

The Fageol-Liner incorporates highest quality construction throughout. The design utilizes, with modifications, the famous Fruehauf Aerovan bodies, which annually roll up millions of miles carrying loads in excess of 40,000 lbs. In adapting this welded steel body, with modifications to roof and roof cap contours for styling purposes, a vehicle has been created with superior structural ability plus the advantages of tremendous mass production economies.

In evaluating Fageol-Liner advantages one need consider only that tooling which produces 1,500 to 1,800 units per month is utilized to produce Fageol-Liner bodies. This fact alone makes possible the statement "Higher Quality at Lower Cost."

Fageol-Liners are offered for propane, gasoline or diesel operation, as desired.

Propane and gasoline coaches are powered by Fageol engines rated at 162 to 250 BHP. Diesel buses utilize Cummins Model NRB and NHB engines, ranging from 150 to 275 BHP.

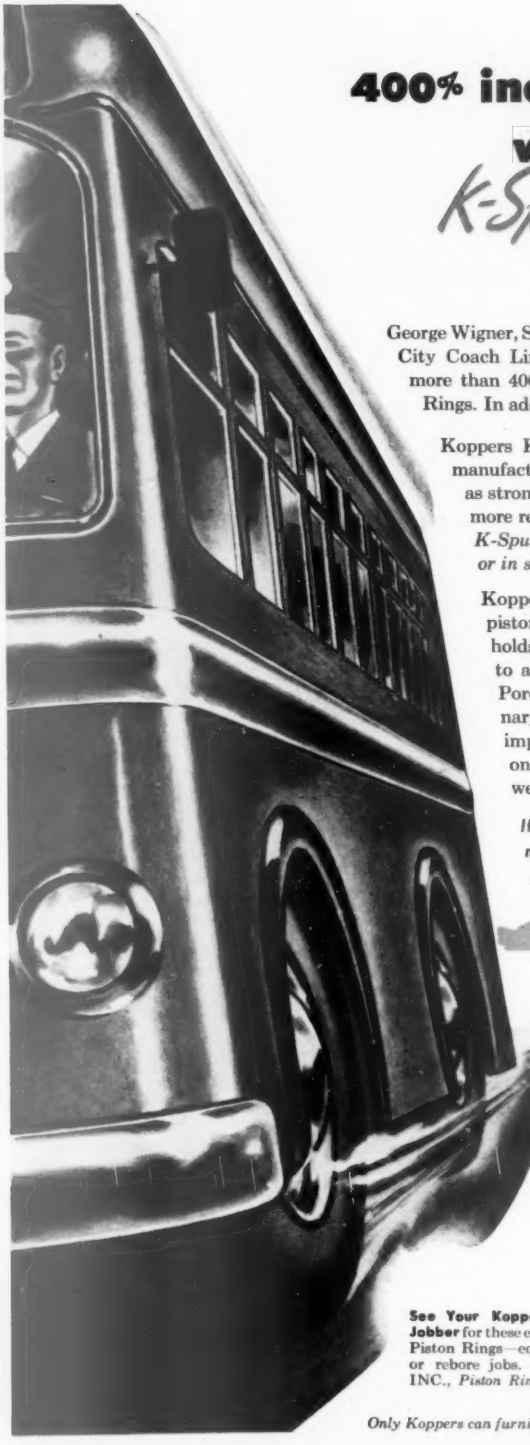
Fageol-Liners operate as smoothly, economically and with the same low maintenance expense typical of all Twin Coaches. Interior and exterior styling is of the finest.

But — Fageol-Liners are priced substantially below other coaches of similar capacity. They offer forward-looking operators an opportunity to greatly reduce their capital investments and operating costs.

For the first time in transit history, a manufacturer has produced a new and better motor coach, complete in every detail, superior in every feature — AT A GREATLY REDUCED PRICE.

We invite you to inspect the new Fageol-Liner at your convenience. Demonstration itineraries are now being arranged.

The Fageol-Liner is "at home" in traffic, suburban areas or on the open road.



400% increase in oil mileage with KOPPERS *K-Spun* porous chrome piston rings

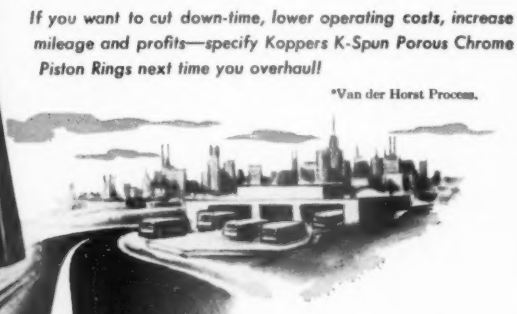
George Wigner, Superintendent of Maintenance for Evansville (Indiana) City Coach Lines, Inc., says: "We have increased our oil mileage more than 400% by using Koppers K-Spun Porous Chrome Piston Rings. In addition, we have substantially decreased cylinder wear."

Koppers K-Spun is an entirely different piston ring material, manufactured by a centrifugal casting process. K-Spun is twice as strong—4 times more resistant to combustion shock—much more resistant to wear than ordinary ring materials. *Koppers K-Spun Rings are guaranteed against breakage in installation or in service!*

Koppers Porous Chrome* has proved to be the outstanding piston ring development of the century! The *porous surface* holds and distributes oil during break-in, quickly wears down to a perfect seat of long-wearing solid chrome! Koppers Porous Chrome Rings last up to 4 times longer than ordinary rings—reduce cylinder wear 50% or more! And most important—Koppers puts the chrome where it belongs—on the top compression ring—the ring that gets the *most* wear, the *most* heat, the *least* lubrication!

If you want to cut down-time, lower operating costs, increase mileage and profits—specify Koppers K-Spun Porous Chrome Piston Rings next time you overhaul!

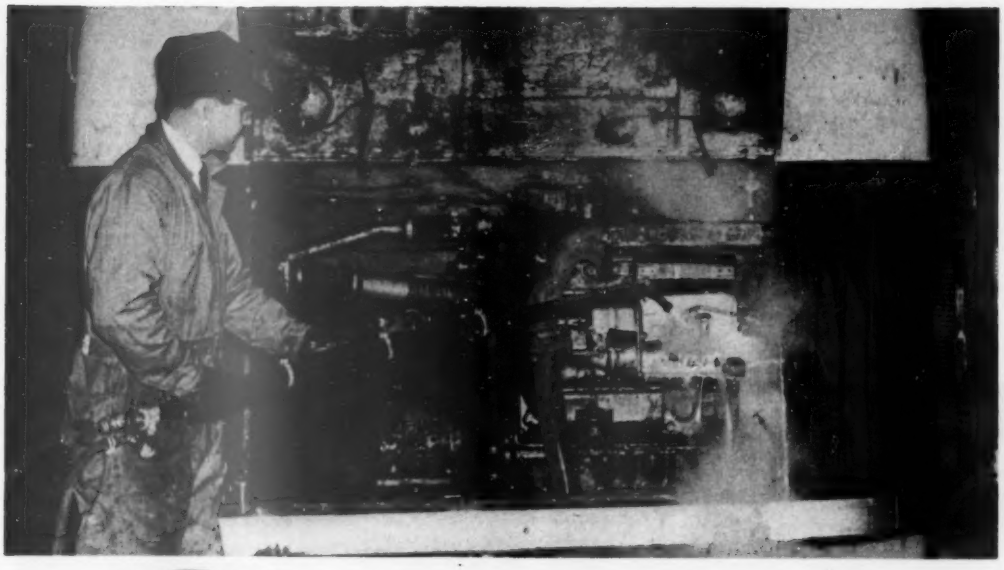
*Van der Horst Process.



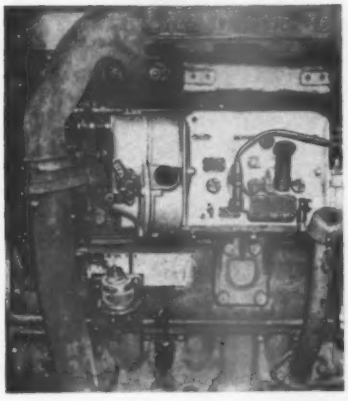
See Your Koppers American Hammered Jobber for these extra long wearing Koppers Piston Rings—equally effective for re-ring or rebore jobs. KOPPERS COMPANY, INC., *Piston Ring Dept.*, Baltimore 3, Md.

AMERICAN HAMMERED KOPPERS *K-Spun* POROUS CHROME PISTON RINGS

Only Koppers can furnish K-Spun or Porous Chrome!



Slash hours off cleaning time



Here's visible proof of the cleaning efficiency of the Oakite Steam-Detergent Gun. Top photograph at the left shows bus Diesel motor at the end of a 6500 mile trip through twenty states. Bottom photograph shows the same motor *only minutes later,* after the Oakite Steam Detergent Gun had blasted clean, completely rinsed away, all grease and dirt.

The Oakite Steam-Detergent Gun cleans fast because it hits grime three ways at once—with combined heat, force, powerful detergent. Cleans completely because spray reaches everywhere—into corners, around fittings and bolt heads. Can't be beat for cleaning rear engines, louvres, undercarriages between runs . . . for cleaning transmissions and motor blocks before overhaul. Tops for paint stripping, too.

FREE Booklet 4401 tells all about Oakite Steam-Detergent Cleaning . . . all about other job-proved Oakite methods for speeding maintenance, cutting maintenance costs. Clip the coupon and mail it—today!

SPECIALIZED INDUSTRIAL CLEANING

OAKITE

MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

Oakite Products, Inc., 16C Thames St., New York 6, N.Y.

Please send me your Booklet 4401 telling all about Oakite Steam-Detergent Cleaning, other Oakite maintenance methods.

NAME_____

ADDRESS_____

COMPANY_____

Thermoid
Brake Blocks
. . . for lowest cost-per-mile

In these days of high speeds, heavy loads and fast stops, you need brake blocks that can take it . . . mile after mile, week after week.

Thermoid Brake Blocks withstand the highest operating temperatures. Throughout their long life, they retain their original uniform friction, unaffected by weather, wet or dry, and meet the strictest state or municipal regulations on stopping distances. Despite their rugged construction, Thermoid Brake Blocks do not score or wear down your drums.

Let Thermoid make a survey of your fleet and recommend the right friction material for lowest cost-per-mile on your particular vehicles. No charge or obligation.

Ask your jobber to arrange for a survey. Or write us direct.

Thermoid

the standard of precision processing in brake lining, brake blocks, hydraulic fluid, cylinder assemblies, hydraulic brake parts.

Thermoid Company • Trenton, New Jersey

STANDARD ENGINEER'S REPORT

DATA

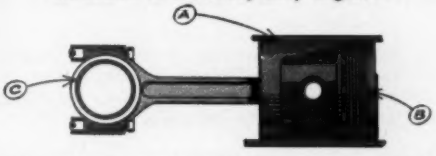
LUBRICANT	RPM Delo Oils
UNIT	#450 International gasoline engines
CONDITIONS	Heavy hauling
PERIOD	1½ years
FIRM	Kenneth Poorman Co., Portland, Oregon.

Rings "perfect", only 0.001 cylinder wear after 80,000 miles!

RPM DELO OILS eliminated all stuck rings, scoring and deposit trouble in 21 units like these, hauling loads up to 72,000 pounds on construction jobs. 80,000 miles after switching to RPM DELO Oils a check showed: "Rings so perfect they could have been put back in the engine. Average cylinder wear only 0.001 inch," according to Maintenance Supt. C. H. Johnson, Kenneth Poorman Co., Portland, Ore.

"100,000 MILES IS NOW OUR OVERHAUL PERIOD, but the way RPM DELO Oils perform, I believe we could extend it to 200,000 miles," says Mr. Johnson (left), shown here with Manager Joe Stephani. RPM DELO Oils have made many outstanding service records in all types of heavy-duty gasoline and diesel engines. They will keep your engines clean, reduce wear and cut operating costs. One of these will meet the operating conditions in your heavy-duty engine: RPM DELO Heavy Duty, RPM DELO Special, RPM DELO Supercharged-1 Oil, RPM DELO Supercharged-2 Oil.

How RPM DELO Oils reduce wear, corrosion, oxidation in all Heavy-Duty Engines



A. Contain special additives that provide metal-adhesion qualities...protect parts whether hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean...helps prevent piston scuffing.

C. Special compounds stop corrosion of any bearing metal and foaming in crankcase.

FREE BOOKLET on the RPM DELO Oils gives you complete information. Write or ask for it today.

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

RPM DELO LUBRICATING OILS

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

STANDARD OIL COMPANY OF CALIFORNIA • San Francisco
THE CALIFORNIA OIL COMPANY • Barber, N. J., Chicago, New Orleans
STANDARD OIL COMPANY OF TEXAS • El Paso, Texas
THE CALIFORNIA COMPANY • Denver, Colorado

EAST NEW YORK SHOP AND GARAGE USES

71 GLOBE HOISTS

TO SERVE OVER 2300 BUSES—

THE WORLD'S LARGEST INSTALLATION

BOARD OF TRANSPORTATION, CITY OF NEW YORK MAINTENANCE SHOP AND GARAGE SPECIFIES GLOBE HOISTS FOR COMPLETE CYCLE OF MAINTENANCE FROM "A" TO "E"

The world's biggest battery of hoists are housed in the New York City Transit System's East New York Plant which has the most modern and efficient maintenance system in the world.

The installation is the result of continued technical cooperation between Globe engineers and the engineers and executives of the New York City Transit System.

14 Globe Hoists are installed on the ground floor garage servicing 300 buses through Class A, B and C maintenance.

57 Globe Hoists are installed on the second floor to serve a fleet of 2,000 buses. This shop can handle Class D semi-overhauls and Class E complete overhauls on 70 buses at one time.

The selection of Globe Hoists was made after careful study of pits, overhead cranes and the various types of hoists available—and an evaluation of Globe Hoist features for bus maintenance operations.

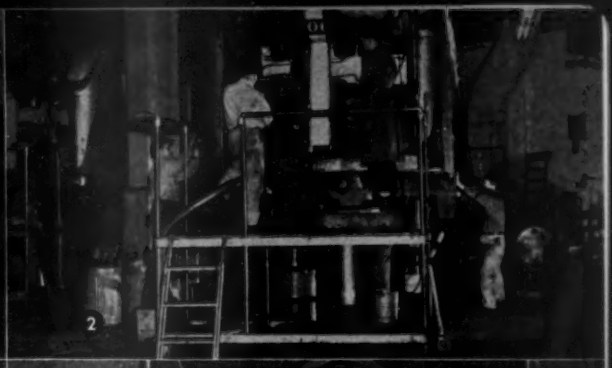
Of particular importance is the fact that in their lowered position, Globe Hoists are flush with the floor. Vehicles can be driven on or off quickly—for greater efficiency and for traffic convenience within the shop. Another feature of the Globe 2-post Hoists is a patented universal swivel jack which rotates 360 deg., and slides along the rails of the hoist. This jack fits into pads which are mounted on the underside of the chassis to provide a quicker, safer method of raising and lowering buses than when contact is made with the axles.

The hoist arrangement and the swivel jack contact permits convenient and easy removal or replacement of any item of underside apparatus—including springs, transmission, axle assemblies and engines.

The installation of Globe Hoists offers real economy for fleet operators. Globe technical assistance is available to help you with your bus or truck maintenance problems. For further information, write Globe Hoist Company, 1000 E. Mermaid Lane, Philadelphia 18, Pa.

Des Moines **GLOBE HOIST COMPANY** Philadelphia

1 *Inspection and lubrication on a Globe Hoist (note safety bar through post).*



2 *Class A, B and C work proceeds on both levels with aid of moveable platform.*

3 *Hoist can be raised to convenient working height for pulling axle shaft.*

4 *Guess work is eliminated from brake work when the mechanic can see what he is doing.*

5 *Twin coach engine raised in position with the aid of a Yale truck.*

6 *Universal swivel jacks leave plenty of room for hooking up rear engine drive line.*

7 *Body repair work is faster and easier on the mechanics when bus is raised on a Globe Hoist.*

8 *Bus may be positioned at intermediate height for mechanic's convenience in front body work.*

Introducing

GUNITE

HEAT TREATED

GUNITE

BRAKE DRUMS

Which Offer You Improved Bus Brakes!

All the superior qualities of the famous GUNITE Heavy Ribbed Brake Drums have been retained and still further improved by this new GUNITE heat treating process. The excellent performance of GUNITE Brake Drums on all four wheels of buses is even more pronounced when new Heat Treated GUNITE Brake Drums are used.

Ask For GUNITE "Normalized" Brake Drums

GUNITE Normalized Brake Drums are heat treated to bring you still more uniformity of material. The famous features of GUNITE metal including even wear characteristics, the elimination of hard spots and elimination of glazing tendencies are still further enhanced in the GUNITE Normalized Brake Drum. All these factors contribute to longer lining life, longer drum life, and silent operation. You get lower cost per mile with GUNITE Normalized Brake Drums.

FOUNDRIES CORPORATION

Rockford · Illinois

First Choice for Availability!

When you need replacement parts . . . without delay . . . depend on Delco-Remy!

Delco-Remy replacement parts for Delco-Remy-equipped vehicles, large and small, old and new, are available everywhere.

UNITED SERVICE MOTORS

DELCO-REMY—A UNITED MOTORS LINE
Available Everywhere Through
UNITED MOTORS DISTRIBUTORS

Delco-Remy
DIVISION, GENERAL MOTORS CORPORATION
ANDERSON, INDIANA

WHEREVER WHEELS TURN OR PROPELLERS SPIN

"the best answer to our tool needs"

February 12, 1951

Using Snap-on Tools is a habit in our shop. The combination of Snap-on quality and Snap-on service through their salesman, Mr. Hugo Riegel, has proved the most economical, time-saving, satisfactory answer to our tool needs.

Jack Warner, Service Manager
Taylor's Inc.
19711 Livernois Avenue
Detroit, Michigan

Snap-on* Service

Men like these . . . 800 STRONG bring Snap-on Service to shops everywhere

Willie B. McMillan
Dallas Branch

Fred B. Reeve
Philadelphia Branch

W. H. Brooks
Charlotte Branch

Art Charlton
Vancouver Branch

John W. Barkell
Minneapolis Branch

Hugo V. DiGiantomasso
Los Angeles Branch

H. E. Campbell
Pittsburgh Branch

E. L. Morgan
Indianapolis Branch

Erwin Rawlings
Chicago Branch

Melvin Frank
Omaha Branch

Thomas L. Addis
Syracuse Branch

Ralph Parham
Jacksonville Branch

Clyde R. Hudson
Buffalo Branch

James E. King
St. Louis Branch

Walter H. Schroeder
Seattle Branch

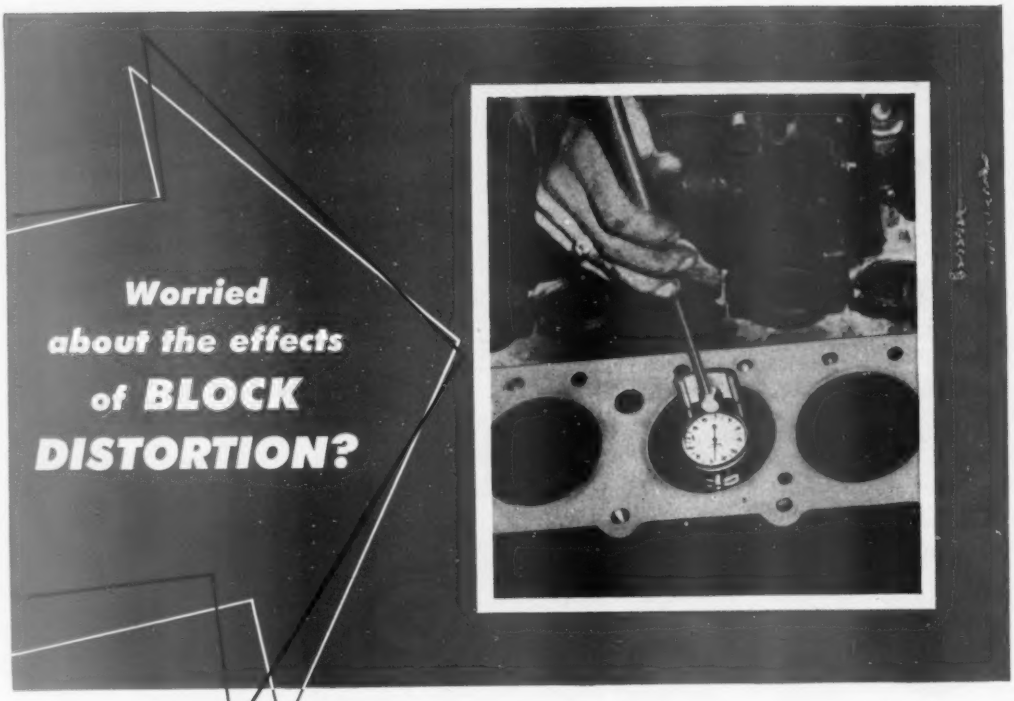
Evert H. Caton
Kansas City Branch

Snap-on* Tools

● Service Manager Warner tells you why thousands of shops—tens of thousands of mechanics—look to their Snap-on Man for what's new and best in hand and bench tools. *Snap-on Tools plus Snap-on Service!* Top quality *professional* tools, brought right into your shop—right to the bench—where a man can select and try them *on the job!* No waste time. No guesswork. He *knows* the tool's the one he wants—that it does the job properly. Shops and their men, the nation over, have boosted income 20 to 40 per cent after equipping with Snap-on Tools. Write for your copy of the 104-page Snap-on Catalog of more than 4,000 quality tools.

*Snap-on is the trademark of Snap-on Tools Corporation.

SNAP-ON TOOLS CORPORATION
8040-F 28th Avenue
Kenosha, Wisconsin



Pedrick will get you off the hook!

Block distortion will be with us always—due in large measure to higher compressions and higher operating temperatures. Whatever its causes, it can be licked—and completely—by installation of the proper Pedrick Engineered Sets, with the expert help you get from your Pedrick jobber.

Pedrick Piston Rings are *conformable*—form an amazingly snug fit in distorted or worn cylinders. Power and lubrication are kept where they belong. Give blow-by the go-by—prevent needless oil waste, get new engine compression—by installing the Pedrick Engineered Set specifically designed for the job, and guaranteed to do it.

Pedrick specialization in piston rings during the past 31 years has paid off in millions of satisfactory money- and worry-saving installations. Have your Pedrick jobber specify and supply the correct Pedrick Engineered Set and be *sure* of a perfect, long-lasting job!

• • •

WILKENING MANUFACTURING CO., Philadelphia 42, Pa. *In Canada:* Wilkening Manufacturing Co. (Canada) Ltd., Toronto.

Pedrick®

"HEAT-SHAPED"

PISTON RINGS

FOR 31 YEARS, SUPPLIER OF PISTON RINGS TO LEADING VEHICLE AND ENGINE MANUFACTURERS

When you buy Raybestos you buy longer life

Insist on Raybestos Brake Blocks and PG Truck Sets—both factory-packaged with the right materials for every installation. Also insist on Raybestos Heavy Duty Clutch Facings. They are all *Proving Ground Tested*. Write us for the complete Raybestos Fleet Engineering Service—valuable technical data on brake block installation; practical information to give your fleet more efficient brake block results; specific fleet recommendations based on careful surveys.

Raybestos

Raybestos Division of RAYBESTOS-MANHATTAN, INC., Bridgeport, Conn.

AMERICA'S BIGGEST SELLING BRAKE LINING

RM

get 'em.... BOWER ROLLER BEARINGS from your FEDERAL-MOGUL Jobber!

The roller bearing service provided by your Federal-Mogul jobber is unmatched in the industry. Here's why:

Bower Quality—identical with the bearings supplied to leading manufacturers of original equipment. Your Federal-Mogul jobber has complete automotive coverage in famous Bower Spher-O-Honed tapered roller bearings, *plus* popular numbers in straight roller bearings.

Federal-Mogul Service—through the most complete service network in the bearing business, Federal-Mogul makes Bower roller bearings *immediately* available. You get the parts you want —and you get 'em when you want 'em!

FEDERAL-MOGUL SERVICE
(Division of Federal-Mogul Corporation)
DETROIT 13, MICHIGAN

BEARING FEDERAL Mogul SERVICE

"Might as well leave out the shock absorbers, too!"

What's the gentleman above saying? Listen . . .

"If we don't start making our riders more comfortable," he says, "more of them will start finding other ways to travel. And we can't afford that! I say we might as well leave the shock absorbers out of our new buses if we leave out these modern temperature controls!"

Fortunately, the committee's decision won't be hard to make. Honeywell Moduflow Temperature Controls cost no more than old-fashioned on-off systems. And Moduflow eliminates *all* the poor heating conditions you know so well—stagnant air, drafty floors, hot and cold spots.

You see, Moduflow operates on a different principle. It provides a *continuous* flow of heat, metered to the exact need at any given time. And it provides *continuous* air circulation – so the heat is distributed evenly from wall to wall, from floor to ceiling.

A simple, sure, *air*-operated system, Moduflow is economical to install and maintain—offers many other advantages you'll want to know more about. For complete information on Honeywell Moduflow, call your local Honeywell office or mail the coupon *today*.

MINNEAPOLIS
Honeywell
First in Controls

MINNEAPOLIS-HONEYWELL REGULATOR CO.
Minneapolis 8, Minnesota, Dept. BT-6-98

Gentlemen: Please send me complete information on your Moduflow System for buses.

Name_____

Firm Name_____

Address_____

City_____ Zone_____ State_____

DIAL LOWER COSTS

Lower running costs and lower repair costs are as near as your telephone. Yes, when you contact your United Motors distributor—whether you phone, visit or write—you've taken a mighty big step toward reduction of both maintenance *and* running costs. Here are just three of the money-saving advantages he can offer you:

1 **Leading names in the original-equipment parts industry.** These are the identical parts used on a big percentage of the nation's trucks, buses and cars. Their established quality means better performance, longer life and lower cost per mile.

2 **Parts for all models—old as well as new.** There are twenty United Motors warehouses and thousands of inventories strategically located across the nation. These insure delivery of any part in the shortest possible time—at any time!

3 **Time-saving service.** Because your United Motors distributor is in many cases a single source for United Motors lines, he can save endless hours often wasted in fruitless shopping.

UNITED SERVICE MOTORS

- DELCO Batteries
- AC Gauges, Speedometers and Rebuilt Fuel Pumps
- SAGINAW Jacks
- MORAINE Engine Bearings
- DELCO Radio Parts
- ROCHESTER Cigar Lighters
- HYATT Roller Bearings
- INLITE Brake Lining
- HARRISON Heaters
- GUIDE Lamps
- DELCO Clocks
- NEW DEPARTURE Ball Bearings
- DELCO Shock Absorbers
- MORAINE Gasoline Filters
- HARRISON Thermostats
- DELCO-REMY Starting, Lighting and Ignition
- KLAXON Horns
- HARRISON Radiators
- ROCHESTER Carburetors
- DELCO Hydraulic Brakes

These services—plus many other advantages—are yours when you deal with your United Motors distributor. So is his long experience in efficient vehicle operation and maintenance. Why not discuss *your* truck operating problems with him right now?

UNITED MOTORS SERVICE

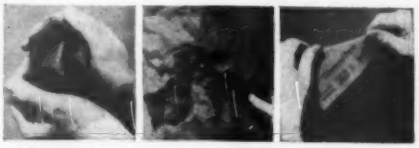
DIVISION OF GENERAL MOTORS CORPORATION
GENERAL MOTORS BUILDING, DETROIT 2, MICHIGAN

New Red-I-Cut

WATERPROOF PAPER

"Red-I-Cut" Waterproof Paper is a brand-new product by CARBORUNDUM that brings time-saving ease and efficiency to mechanical or hand sanding. Never before have you used an abrasive paper with greater *adhesion* of abrasive to backing... never before known such *flexibility* in reaching those hard-to-get-at places. *Lasts longer,* too, with its superior resistance to pulping, tearing and peeling.

Simple 3-Way Test
shows "Red-I-Cut" superiority...



Hundreds of shops are making this simple test with "Red-I-Cut" Paper (*as illustrated above.*) Crumple a sheet of "Red-I-Cut" Paper—feel its pliability and flexibility. Flatten out sheet again—note lack of peeling and cracking. Bend a corner and crease it—see how it takes such abuse without tearing.

Send coupon TODAY for

FREE SAMPLE

Advertising Department
THE CARBORUNDUM COMPANY
Niagara Falls, New York

I'd like to make a 3-step comparison test of "Red-I-Cut" Paper with the product we are now using. Send my *free* sample.

NAME _____

CONCERN _____

ADDRESS _____

CITY OR TOWN _____ STATE _____

***You can do a better job with products by* CARBORUNDUM**

TRADE MARK

"Carborundum" and "Red-I-Cut" are trademarks of The Carborundum Company, Niagara Falls, New York.

90-19

THE NEW, LOW COST
LUBRICATION INSURANCE FOR FLEETS!

Now you can have the added savings of buying GENUINE WIX in the economy-priced WIX-PAX Service. WIX-PAX comes to you *direct from the factory or Pacific Coast Warehouse*—PRE-PAID shipments—in lots of 100 lbs. or more. WIX-PAX Cartons of 12 or 24 Sock Type or 12 Can Type Cartridges with gaskets included. Assortments of your choice can be had in these small, standard cartons. This is no "second" line graded down to a price . . . it's the revolutionary new, high performance WIXITE construction which traps all contaminants without removing valuable detergent additives. It's engineered to fit all the popular oil filters on your buses. Ask your Jobber for prices on this new, low cost, direct WIX-PAX Service—it will make dollars and sense to you.

SERVICED BY YOUR JOBBER

wix

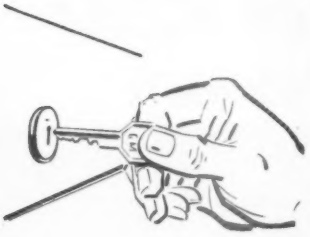
TRADE MARK REG.

OIL FILTERS • CARTRIDGES

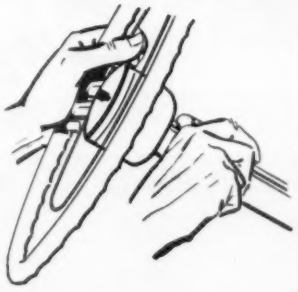
WIX ACCESSORIES CORP'N • GASTONIA • N•C•

CANADIAN FACTORY: WIX ACCESSORIES CORP. LTD., 11 Wabash Ave., Toronto 3, Ont.

As Simple as starting a car



1. Set Inland Strip in body panel . . . simple as starting engine.



2. Set glass in Inland Strip . . . simple as setting gears.

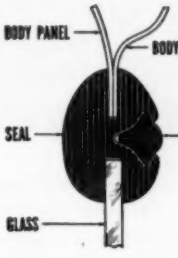
3. Zip filler strip into locking channel . . . simple as pulling out from curb.

Just three steps . . . simple, easy, time-saving operations. No wonder that replacing broken glass is a low-cost job when the vehicle is equipped with Inland Self-Sealing Weather Strip. One man does it, and in much less time than it takes two men to do ordinary sealing. *That cuts costs!*

And you get *permanent* and *complete* leakproofing with Inland Self-Sealing Weather Strip. The seal is made by the natural resilience of rubber, permanently compressed. In any weather, and regardless of temperature changes, *there can be no leaks!*

You can specify Inland Self-Sealing Weather Strip in the vehicles you buy. Do it! You'll get permanent weatherproofing, and save time and cost in glass replacement.

INLAND MANUFACTURING DIVISION • General Motors Corporation, Dayton, Ohio



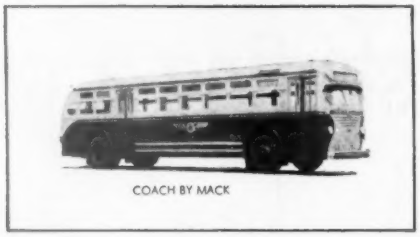
Easy, Fast, Economical!

The seal goes into the body panel, the glass into the seal, and the filler strip into the locking channel. That's all . . . a fast, low-cost, one-man job . . . done once . . . for permanent weatherproofing!

INLAND MANUFACTURING

Self-Sealing Weather Strip

(PATENTED)



COACH BY MACK

ROCHESTER SPECIFIES

Goodall *Super Redo*

Plastic Upholstery

More and more bus operators are specifying Goodall's Super Redo plastic upholstery for unusual durability and minimum maintenance. Super Redo is a *Blended-for-Performance* plastic constructed especially for the tough use and abuse of heavy passenger loads. It easily resists stains, perspiration and grease, and most surface soils can be wiped away with a wet cloth. On your next job specify Goodall Super Redo. It is SUNSHINE-TESTED to stay rich-looking and colorful throughout its long life.

Goodall-fabrics

Subsidiary of Goodall-Sanford, Inc.

THE FINEST NAME IN FABRICS

©1951, Goodall Fabrics, Inc. (Subsidiary, Goodall-Sanford, Inc.)

GOODALL FABRICS, INC. • NEW YORK • BOSTON • CHICAGO • DETROIT • SAN FRANCISCO • LOS ANGELES

Sure!.. you can get

BETTER MILEAGE

with **WORLD BESTOS** BRAKE BLOCKS

3 COMPOUNDS TO CHOOSE FROM

the proper application of these three compounds on front and rear wheels will give you

. . . . the exact amount of brake you need plus the longest possible mileage—much more than you would think.

World Bestos sales engineers will be glad to give engineering assistance on your brake problems.

See your Jobber or Write

WB

WORLD BESTOS NEW CASTLE, INDIANA

ADLAKE-NATIONAL Escape Windows, lower stationary and upper drop. This design combines dependable protection with many exclusive comfort features.

Adlake-National Escape Windows

ADLAKE-NATIONAL Escape Windows guarantee your customers a quick, dependable exit — with a maximum escape opening. In an emergency the entire sash can be easily pushed out, allowing the full window opening for escape.

And ADLAKE-NATIONAL Windows add to your passengers' comfort at all times. They keep their easy operation for the life of the bus... and their trim, modern design adds to the attractive appearance of the coach. They're rattle-proof and weather-tight... and they permit maximum view and maximum ventilation.

Two Leaders of the transportation industry—The Adams & Westlake Company and the former Transportation Division of the National Lock Washer Company—have joined their experience to produce ADLAKE-NATIONAL Windows. Their combined qualifications are your best guarantee of dependability.

For Complete Information on this and other ADLAKE Windows, just drop a card to ADLAKE-NATIONAL, 1112 N. Michigan, Elkhart, Indiana. No obligation, of course.

Adlake TRADE MARK

THE Adams & Westlake COMPANY

Established 1857 • ELKHART, INDIANA • New York • Chicago

Manufacturers of ADLAKE Specialties and Equipment for the Transportation Industry

Added protection for these young passengers

Safety Glass

BY PITTSBURGH

Pittsburgh Safety Glass is used throughout this Oneida school bus. The V-type windshield is Duplate, other glass is Duolite. Built by Oneida Products Corporation, Canastota, N. Y.

54-passenger Wayne school bus body. 1210-square-inch windshield is Duplate Safety Glass. Big "ultra-safe" windows of Duolite Safety Glass. Built by Wayne Works, Richmond, Ind.

Manufacturers of these school buses take every possible step to assure their young passengers the greatest degree of safety. In windows and doors this means Safety Glass by Pittsburgh.

Large windshields of Duplate Safety Glass assure the driver undistorted roadview with the full range of vision so vital to safe pupil transportation.

Side windows, rear windows, drivers' windows and door lights of Duolite Safety Glass provide ample vision for young passengers along with the maximum measure of safety.

Many manufacturers have chosen Safety Glass by Pittsburgh as standard equipment in every type of bus—school, interurban, city, sightseeing and special purpose. Records of satisfactory service recommend this glass to you for new vehicles or glass replacements.

The Duplate and Duolite trade-marks, etched on every piece, assure you the high quality resulting from years of Pittsburgh research and manufacturing experience. You can obtain Pittsburgh Safety Glass from a nearby member of our national system of branches and dealers. If you are not acquainted with him, write us for his name and address. Pittsburgh Plate Glass Company, 2170-1 Grant Building, Pittsburgh 19, Pa.

Look for one of these trade-marks, etched in the corner of the glass.

Curved glass windshield of Duplate Safety Glass and curved rear windows of Duolite increased driver vision in this Hackney "Fullview" school bus body. Other windows are Duolite, too. Built by Hackney Bros. Body Co., Wilson, N. C.

Duplate and Duolite Safety Glass are combined again in this Hicks Arch-Bilt school bus body, passing all rigid state safety requirements. Built by Hicks Body Company, Inc., Lebanon, Ind.

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

IN THE SPOTLIGHT WITH TRUCKERS EVERYWHERE

The spotlight goes to the star performer every time, and Delco is the No. 1 performer when it comes to batteries. Truckers everywhere say you can't beat a Delco for low cost per mile. They've learned that Delco has the stamina to stand up under the wear and tear of heavy-duty service. And drivers, too, know that with a Delco on the job they have unsurpassed dependability at their command.

Delco's *balanced performance* is the key to low-cost operation of an automotive electrical system. More trucks use Delcos than any other brand of battery—next time *you* need batteries, get Delcos. They are available everywhere.

DEALERS EVERYWHERE

UNITED SERVICE MOTORS

DELCO BATTERIES—A UNITED MOTORS LINE

DELCO Heavy-Duty Batteries

Any way you Look at it...

A BLACKHAWK JACK IS YOUR BEST BET!

No doubt about it! From sleek, efficient design to in-built guts, Blackhawk Hydraulic Jacks have that superior quality that distinguishes a leader. Brute power, precise control, dependability under all conditions—these are Blackhawk service-proved characteristics that make them the predominant choice of fleet and bus operators, and the automotive, aviation and industrial fields. That's why Blackhawk Hydraulic Jacks are YOUR best bet!

A Product of **BLACKHAWK MFG. CO.,** Dept. J1261, **Milwaukee 1, Wis.**

This seal is found ONLY on BLACKHAWK HYDRAULIC JACKS—your assurance of a wise and safe investment.

BLACKHAWK

CONSOL
FOR BUSES
TROLLEY
COACHES
P.C.C. CARS
RAPID
TRANSIT
CARS

IPATED

Door Control Equipment

DEPENDABLE and TROUBLE-FREE door operating equipment means, to experienced operators all over the country, "CONSOLIDATED."

CONSOLIDATED DOOR OPERATING EQUIPMENT (Electric or Pneumatic) gives you and your customers the CERTAINTY of smooth, fast trouble-free DOOR OPERATION, in ALL types of modern transportation units.

Consolidated Equipment has nearly 60 years of specialized EXPERIENCE behind it. It is engineered and built to assure many years of heavy service. Its dependability has been proved by MILLIONS of car and bus miles of performance, with a minimum of maintenance. This explains why more and more of the nation's transit properties are specifying CONSOLIDATED for their new vehicles.

CONSOLIDATED CAR HEATING COMPANY, INC.

CHICAGO ALBANY NEW YORK

No matter

how you operate–

this SUPER oil can...

Double Engine Life...

If your buses operate at high speeds over long distances . . . or if they operate in city traffic, there is a lubricating oil expressly made for you— Sinclair SUPER TENOL.®

Sinclair lubrication specialists developed this lubricant expressly to *keep engines clean* and *lengthen engine life,* under all operating conditions— sustained high speeds or continuous starts-and-stops. And they succeeded! Operators report, using SUPER TENOL, they have more than doubled engine life between overhauls.

Figure what this can mean in your buses: half the overhaul downtime, more revenue trips . . . lowered operating costs. Better plan to change to SUPER TENOL right away!

KEEPS ENGINES CLEAN— NO STICKING RINGS

RETARDS WEAR— STRETCHES OUT ENGINE LIFE

LENGTHENS TIME BETWEEN OVERHAULS

LOWERS OPERATING COST

Sinclair Super Tenol . .

For lubrication counsel, see your local supplier of Sinclair Products

LONG HAUL. If your buses operate at high speeds over long distances, at high engine temperatures, Sinclair SUPER TENOL can keep down deposits, keep valves and oil lines free, keep engines clean.

..between Overhauls!

STOP-and-START. City traffic — starts and stops, idling, sudden engine loading — is tough on engines, calls for a specialized lubricant — Sinclair SUPER TENOL — to keep engines clean and maintenance low.

.. for long or short hauls.

or write to Sinclair Refining Company, 630 Fifth Avenue, New York 20, N.Y.

This will stop you!

DELCO SUPER 11
Heavy-Duty
BRAKE FLUID

A safe stop every time is a sure thing with Delco Super 11 brake fluid. Heavy-duty Delco Super 11 withstands extreme heat generated in the braking of heavily loaded, fast-moving trucks and buses. It is equally effective in stop-and-go driving in the light delivery truck field. Vapor-lock will not form at temperatures up to 325° and, equally important, Delco Super 11 flows freely at 60° below zero.

Put Delco Super 11—the brake fluid that *exceeds* all SAE standards—in your trucks or buses. You can depend on it *all* ways.

DELCO BRAKE REPAIR KITS FOR DEPENDABLE REPAIRS

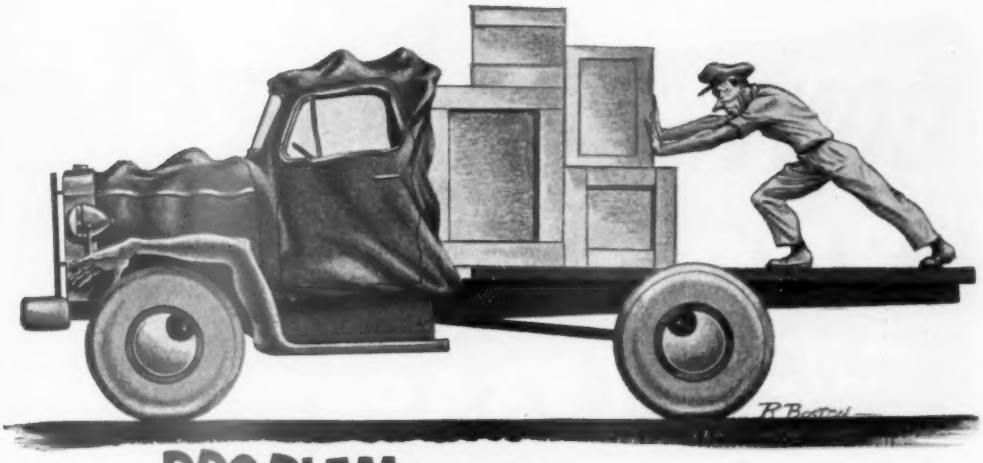
Scores of fleet owners have solved their brake service problems with time-saving Delco Repair Kits. Complete parts are included in the Delco Master Cylinder Repair Kit and the Delco Wheel Cylinder Repair Kit illustrated above. Available in quantity through any United Motors distributor.

UNITED SERVICE MOTORS

DELCO BRAKE—A UNITED MOTORS LINE
Available Everywhere Through
UNITED MOTORS DISTRIBUTORS

Delco SUPER 9 AND SUPER 11 BRAKE FLUID • DECLENE • BRAKE PARTS
STANDARD FOR EQUIPMENT • THE STANDARD FOR REPLACEMENT

MORAINE PRODUCTS DIVISION OF GENERAL MOTORS



PROBLEM:
How to move the payload forward —

Saginaw Steering has once again come up with the *right* answer. Another major profit-eating hauling problem has been solved.

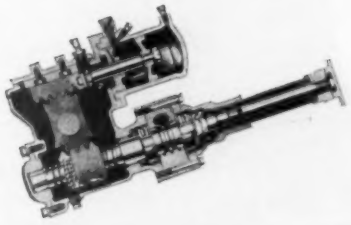
Use of Saginaw's revolutionary new hydraulic power steering gear permits up to *double* the usual front axle payload . . . brings easier, safer steering *plus* new payload profits—with no increase in truck size . . . no danger of exceeding legal load limits.

Saginaw power steering has an outstanding record of efficient, trouble-free operation behind it . . . is built by the largest manufacturer of steering equipment in the world.

Whatever your requirements, you'll find Saginaw hydraulic power steering gear will fill the bill — will bring bigger payloads . . . bigger profits than ever before. Contact your truck manufacturer. Ask about Saginaw power steering installations today.

IF IT'S EASY TO STEER—IT'S A SAGINAW GEAR

ANSWER: Install SAGINAW hydraulic power STEERING GEAR



Saginaw

STEERING GEAR DIVISION
General Motors Corporation, Saginaw, Michigan

SSGi PRODUCTS

STEERING GEARS AND LINKAGES • PROPELLER SHAFTS • TRANSMISSION CONTROLS • TURN SIGNALS • DIESEL ENGINE PARTS • BALL BEARING SCREW AND NUT ASSEMBLIES • AUTOMOBILE JACKS

DON'T take the Heart Out of your DELUXE!

THE HEART OF YOUR DELUXE FILTER IS THE
Genuine DeLuxe Cartridge
WITH ITS EXCLUSIVE SPRING-AND-CONE

The Spring-and-Cone are indispensable to the DeLuxe Method of Oil Cleansing. That's why in DeLuxe Filters, genuine DeLuxe Cartridge performance defies comparison. Both are vital to the DeLuxe long travel method of oil cleansing . . . the Cone to uniformly feed oil from bottom to top of filter; the Spring to prevent collapse in order to maintain uniform flow of oil. Write for FREE "Key to Clean Lubrication" BOOKLET containing all the facts on filter operation and diagnosis.
DELUXE PRODUCTS CORP., 1407 Lake Street, La Porte, Indiana.

Patented DeLuxe Spring is no ordinary spring. It is made to exacting tensions proven essential through laboratory and road tests to prevent collapse or wadding of cotton as oil is passed through it. Maintained density is especially important in the DeLuxe Oil Filter because, unlike the conventional side-to-side flow filter, DeLuxe travels the oil the LONG way, from bottom to top.

Be a Man Who Knows the Answers!

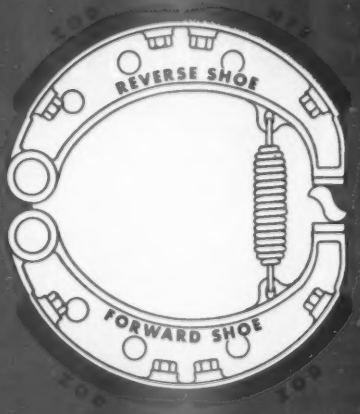
THE MEN WHO KNOW THE ANSWERS, INSIST ON **DELUXE** *Oil Filter*

R-5601 PD

BUS OPERATORS ARE MEN WHO KNOW! Year after year they vote DeLuxe the Number One Filter as indicated by the Winners of Bus Transportation Maintenance Awards. Of 21 winners in 1950, 17 were DeLuxe Users. Year after year it's the same story.

GET BETTER PERFORMANCE UNDER ANY OPERATING CONDITION with Firestone BRAKE BLOCKS

...You can stop FADE with THIS combination!

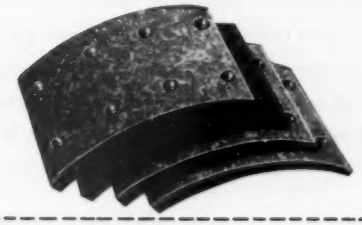


Firestone has a brake block that is guaranteed not to fade. Actual tests prove that it will give quicker stops, smoother stops, and more stops than ordinary brake blocking, without causing excessive heat checking or scoring of drums.

Perhaps you think your brake problems are different from those of other operators. How right you are! In fact, with different roads, different vehicles, and different drivers, no two bus operators have identical operating conditions.

That's why Firestone engineers have developed a complete range of frictions in brake blocks—frictions applied in varying combinations to meet even the most diversified and most severe operating conditions.

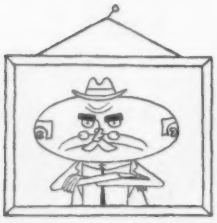
If you have a fade problem, a wear problem, or a problem with heat-checked drums, we can help you with it. If you have no problem at all, but simply want more for your money, we can do something about that too. Let us show you.



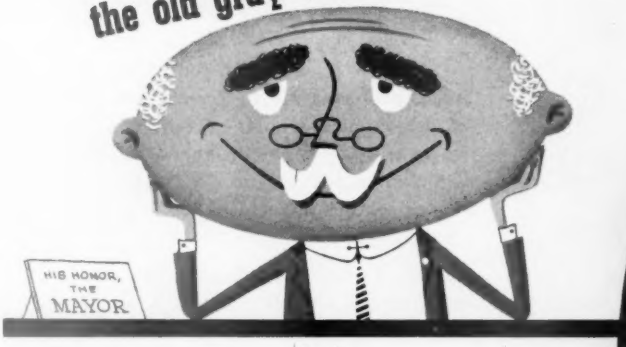
WRITE FOR COMPLETE INFORMATION ABOUT THE NEW FIRESTONE BRAKE BLOCK COMBINATIONS, ADDRESS THE FIRESTONE TIRE & RUBBER COMPANY, AKRON, O.

Enjoy the Voice of Firestone on radio or television every Monday evening over NBC

Copyright, 1951, The Firestone Tire & Rubber Co.



the old gray mayor ain't what he used to be . . .



. . . since he rode a new LUMINATOR FLUORESCENT LIGHTED BUS!

Everybody in your town, from the Mayor to the newsboy on the corner, will be thrilled when they see your new Luminator-lighted buses cruising along Main Street. If you thought you had seen everything that was new and exciting in the bus field, you'll get a real surprise when you see these new "showcases on wheels" engineered for cheerful, high intensity, shadowless and glareless illumination. Luminator Fluorescent Lighting causes civic pride to skyrocket to new heights. It's not just that you get more and better light than ever before, nor that it's a compliment to your judgment in having specified this modern, up-to-date way to light a coach—it's because it has such an interesting effect on revenue, too. That's why alert operators everywhere are investigating Luminator Fluorescent Lighting.

LUMINATOR inc.

LIGHTING ENGINEERS · DESIGNERS · MANUFACTURERS

120 NORTH PEORIA ST., CHICAGO 80, ILLINOIS
IN CANADA: RAILWAY AND POWER ENGINEERING CORP.

We Mobilize for Freedom

WHY Controls are Necessary

One of the encouraging characteristics of the American people is their dislike for government controls. This augurs well for the future of their economic and political freedom.

But for the next few years we must not only tolerate but also help to make effective a whole battery of emergency government controls over our economic life. If we fail to do this now the future of that freedom we cherish will be imperilled. It is the purpose of this editorial—the third in a special series—to explain in simple terms why this is so.

After our military victory in World War II, we rushed through a demobilization which cut our military strength to about one-tenth of its wartime peak. Our allies did much the same thing. But the Russians maintained much of their wartime military strength and built up that of their satellites. With prodigious speed we switched from military to civilian production and went on to enjoy a rousing postwar boom—the greatest in our history.

This boom was in vigorous progress when, on June 25 last year, the Russian-sponsored North Korean army attacked South Korea. Our industrial production was rolling along at almost twice its prewar level. We had labor shortages in many key industrial areas. Under the impact of heavy buying all along the line, prices were climbing.

When the North Koreans smashed into South Korea they smashed into our national consciousness this fact: if we want a fair chance to save our national freedom from destruction by Communist aggression, we must race to restore some of the military power we had so speedily written off after World War II. And we must do it with our resources already very fully occupied with a boom in civilian business.

Program Small Compared to World War II

Compared with our military effort in World War II, the mobilization on which we are now embarked is small. At its peak, under present schedules, it will absorb no more than one-fifth of the total national production. During World War II we reached a point when nearly half of our total production went for war-making.

Moreover, our economy now is much bigger and stronger than it was in World War II. During the last decade there has been an increase of about 15 percent in our labor force. Our workers have had the training advantage of steady employment. The capacity of our industrial establishment is two-thirds again as great as it was ten years ago. Since the war no less than $70 billion has been spent to expand and modernize it.

Given time, the industrial giant we have created could pick up in its stride the added load of production for defense that now is con-

templated. But speed is of the very essence. There is little dissent from the proposition that if we are to stand off Russian aggression successfully we have, at the outside, two years in which to get ready.

Controls Needed to Prevent Chaos

These two facts – (1) the necessity for speed in our rearmament program and (2) an economy already stretched taut by a record civilian boom—create the general necessity for government controls. If we simply pile the billions of added defense expenditures authorized since last June on top of the civilian boom, and let it go at that, two destructive developments would follow. There would be a scramble for scarce materials, notably metals, which would create chaos in those markets. And prices would go through the roof.

Our situation during this mobilization is radically different from what it was when we rushed to get ready for World War II. Then we started with an economy that was coming out of a long depression. There was plenty of slack. Even in mid-1941 we still had over 6 million unemployed. Thus it was possible for us to expand war production greatly and also increase civilian living standards before the limits of our productive capacity made extensive controls necessary. But as we begin this new mobilization we find our economy already operating virtually at capacity. This fact is of key importance in understanding why this relatively small defense program so quickly requires the imposition of controls.

The selection and administration of controls thus far has been badly bungled. The threat of price controls, for example, was broadcast so vigorously and for so long that our people were virtually asked to raise prices and thereby do much to defeat the controls. Adequate taxation directed so as to attack inflation at the source and thus give direct price control a chance to operate has not yet been provided.

Indeed, we could readily assemble a long and devastating catalog of the deficiencies of the government's control program. But that would not dispose of the necessity for controls – by priority, by allocation, and, as a stop-gap, by direct prescription of selling prices – if we are to carry out our mobilization successfully. That is the only means by which a clear right of way for defense production can be cut through the highways of trade and commerce now jammed with civilian boom business.

Hope In The Wilson Plan

Since he became Director of Mobilization, Charles E. Wilson has added a new element of order and hopefulness to the mobilization program. He has laid out a plan which, if we are spared all-out war, would do three things by 1953. First, it would produce the weapons needed by our army and our allies to meet an immediate threat. Second, it would create the capacity that would enable us to move at high speed into weapons production for all-out war – if necessary. Third, it would create the additional production capacity that would restore by that date our ability to resume the climb of the American civilian standard of living.

In technical and industrial terms the Wilson Plan seems to be feasible. If it is successfully carried out, we should be able to begin getting rid of controls rapidly by 1953. But to carry out the program successfully, it must now have vigorous support from everyone. That does not mean mere agreement that it is a good plan. It means that we must conform to the controls that are necessary to make the plan work. In developing this support, the business community is in position to exercise crucially important leadership.

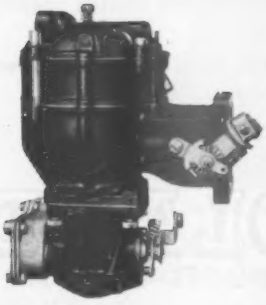
As has often happened in our national history, we are confronted by a paradox. We must accept emergency controls for the time being to insure survival of the freedom that they infringe. But, as we do this, we may find some comfort in the reflection that while controls from Washington are hateful, controls from Moscow would be infinitely worse.

McGraw-Hill Publishing Company, Inc.

Does Your Bus Have Sales Appeal?

IT ALL DEPENDS
ON PERFORMANCE
and
PERFORMANCE
DEPENDS ON

Zenith
CARBURETORS



In the practical field of commercial transportation, product preference is determined solely on performance. Nothing contributes more to the achievement of this desirable end than efficient carburetion. You can be sure that manufacturers whose vehicles are equipped with Zenith, the leader in the field of heavy duty carburetion, have measured carburetion costs in lasting terms rather than initial expense. Zenith's rugged construction, strong idling, freedom from stalling and response to every power demand gives any commercial vehicle added sales appeal. It pays to specify Zenith — the engineers' choice for trouble-free operation.

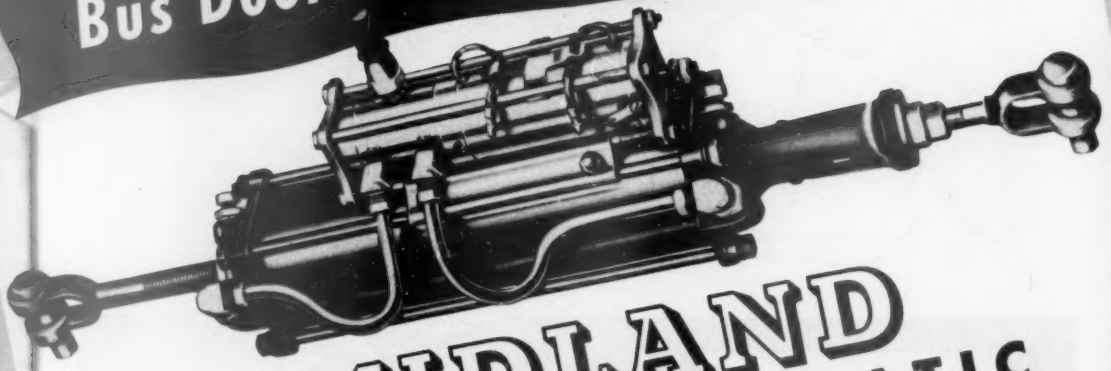
ZENITH CARBURETOR DIVISION OF
696 Hart Avenue · Detroit 14, Michigan

Bendix
AVIATION CORPORATION

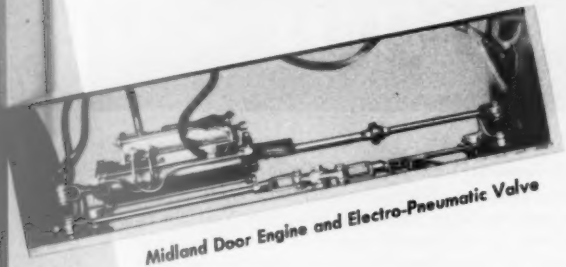
Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.

SAFETY INSURANCE
FOR PASSENGERS
OF ALL AGES

The Greatest Improvement in Bus Door Controls in Years!



MIDLAND
ELECTRO-PNEUMATIC



Midland Door Engine and Electro-Pneumatic Valve

Provides the smoothest operating bus doors on the road today—the highest degree of safety and convenience for your passengers—greater efficiency and economy of operation for you. New in design, thoroughly tested and proved in service. Valves positioned by electrical impulse—held in selected position pneumatically. Installation cost is lower—maintenance is less. Eliminates drain on battery. Controlled by simple electric toggle or push button switch.

Investigate! See your Midland Distributor, or write or phone us in Detroit.

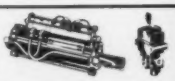
See MIDLAND for full pneumatic or electro-pneumatic door controls

The **MIDLAND**
STEEL PRODUCTS COMPANY
6660 Mt. Elliott Ave. • Detroit 11, Mich.
Export Department: 38 Pearl Street, New York, N. Y.

Air and Vacuum POWER BRAKES

World's Largest Manufacturer of AUTOMOBILE and TRUCK FRAMES

Air and Electro-Pneumatic DOOR CONTROLS



Now! The world's best seat for operators...

made BETTER—
five important ways!

AMERICAN
NEW MODEL NO. 250

New American Bus Driver's Seat No. 250

TO THESE FAMOUS AMERICAN ADVANTAGES:

- 5 adjustments to make seat fit operator perfectly
- Extra-deep, extra-wide, foam-rubber cushion
- 800 breather-holes in leather of seat and back—gives 15 times usual ventilation!
- No chafing gap between seat and back
- Can't jump out of pedestal
- Heavy, reinforced tubular-steel frame

...WE'VE NOW ADDED THESE 5 NEW IMPROVEMENTS:

1. NEW, corrosive-resistant, cast-aluminum base
2. NEW, close-tolerance machining of base to fit seamless, vertical-adjustment tube
3. NEW, greater bearing area between tube and base, for extra rigidity
4. NEW base reduces weight several pounds
5. NEW, simpler design, fewer parts

Write for new illustrated catalog telling the whole story.

American Seating Company

WORLD'S LEADER IN PUBLIC SEATING

Grand Rapids 2, Michigan • Branch Offices and Distributors in Principal Cities

Manufacturers of Transportation, Theatre, Auditorium, School, Church, Stadium Seating, and Folding Chairs

This illuminated control lever is easily attached to steering column . . . blinker light reminds driver that signal is operating.

Follow the safe course . . . equip with

GUIDE

HEAVY-DUTY TURN SIGNAL

for trucks and buses

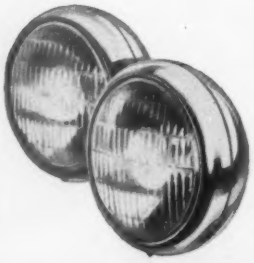
On sunny days or stormy nights, the flashing amber-colored arrows of Guide turn signals can be relied upon to give effective warning. They remove all risk of hand and arm signals. And they're easy to install.

The Guide double-face unit (illustrated) is for front-fender mounting and commands immediate attention from both approaching and following vehicles. Single-face units for either front or rear mounting also are available. All have visors and lenses for greater all-weather visibility.

You can bet your life on Guide—for lamps and signals that are durably constructed to the highest standards. Guide quality *insures* dependable service.

GUIDE FOG LAMPS

For all makes of trucks and buses . . . packaged in pairs, complete with fused switch, wiring and interchangeable mounting for attachment to splash pan, bumper bracket or front fender. . . nationally known and accepted.



UNITED SERVICE MOTORS

GUIDE LAMP—A UNITED MOTORS LINE
Available Everywhere Through
UNITED MOTORS DISTRIBUTORS

Guide LAMP Division of General Motors
Anderson, Indiana

SELF-CONTROL STARTS HERE

AND TO RESTORE
ENGINE PERFORMANCE

OIL-CONTROL STARTS HERE

To stop oil-pumping, replace worn engine bearings

A rubber band and a wad of paper can start real trouble—and so can worn engine bearings! Worn main, connecting rod and camshaft bearings mean poor engine performance. *Performance goes up in smoke!*

When oil-pumping *starts* at the engine bearings, correction must start there, too. Give new piston rings a chance to do their own job—replace worn main, connecting rod and camshaft bearings on every overhaul. Genuine Federal-Mogul Bearings are *engineered* for the job of oil-control!

FEDERAL-MOGUL SERVICE
(Division of Federal-Mogul Corporation)
DETROIT 13, MICHIGAN

control oil-pumping where it starts—REPLACE WITH

FEDERAL-MOGUL

OIL CONTROL

BEARINGS

RECONDITION YOUR ENGINE

FOR MAXIMUM **POWER**

FOR **LOWEST** OPERATING COST

REPLACE WITH ZOLLNER

THE "ENGINEER APPROVED" PISTON

Expertly engineered pistons make a big difference in engine performance — and operating cost. That's why it's always best to insist on Zollner "Engineer Approved" Pistons when reconditioning your engines. The big majority of engine manufacturers work hand-in-hand with Zollner engineers in the development of pistons best suited to heavy-duty use. Over 70% of all makes of trucks and buses are Zollner equipped — and have been for years. Only when you use Zollners can you be sure that your pistons are expertly designed and precision-made to the individual engine specification for utmost performance and economy of operation.

Used and Recommended by over 70% of all Truck and Bus Manufacturers.

ZOLLNER

HEAVY DUTY PISTON EQUIPMENT

ZOLLNER MACHINE WORKS **FORT WAYNE, INDIANA**

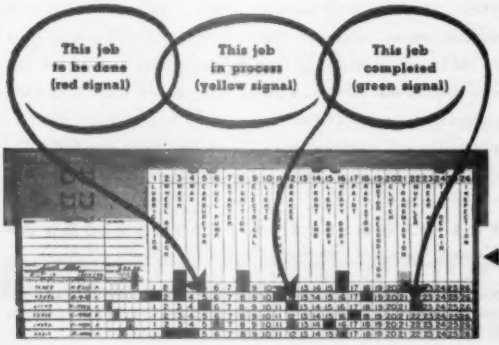
Same Machines...Same Floor Space in our Repair Shop

...yet we're turning out one-third more work!

Sound hard to believe? We might have said so too—till we checked up on some bus operators who reported results like this from their use of Sched-U-Graph boards for scheduling maintenance work.

Then we started analyzing what *causes* maintenance delays. Most places these boil down to: *idle machines* (waiting between jobs) and *idle men* (ditto). If that's the story in your shop too, you should get the facts about Sched-U-Graph, Remington Rand's simple Visible Control Board that completely eliminates these two bogeys right at their source.

Sched-U-Graph *shows* you, graphically, where each of your jobs stands from start to finish. Shows you how each machine is loaded, as far ahead as you care to schedule. Furthermore, Sched-U-Graph keeps all data in *one* compact unit, and thereby cuts down greatly in clerical time. Mail the coupon — see what Sched-U-Graph can do in *your* shop — today.



With Sched-U-Graph, one clerk can assume responsibility for assigning each job, for delivery on schedule. Different colored signals show at a glance each job (1) *to be done;* (2) *in process;* (3) *completed.*

Remington Rand INC

Management Controls Reference Library
Room 1194, 315 Fourth Avenue, New York 10, N. Y.

Yes, I would like to have a free copy of your Booklet KD 341A, on Sched-U-Graph.

Name _____
Firm _____
Address _____
City _____ **Zone** _____ **State** _____

For year · after · year wear

specify genuine leather upholstery

Want to keep your seats out of the repair shop . . . your buses in inviting, first class, profit-making condition months . . . even years . . . longer? Specify Genuine Leather. Look to leather for more durable seating in your new buses, for re-upholstering worn seats in old buses. Operators all over the country report leather is the one material that takes on a patina with age and use that actually enhances its beauty. Leather washes easily with soap and water . . . proves fire and stain resistant . . . is sanitary, moth-proof. For distinction and durability, nothing takes the place of Genuine Leather.

THE UPHOLSTERY LEATHER GROUP

Tanners' Council of America · 100 Gold St., New York 38, N. Y.

American Leather Manufacturing Company, Newark, N. J. • The Ashtabula Hide & Leather Company, Ashtabula, Ohio
Blanchard Bro. & Lane, Newark, N. J. • Delaware Tanning, Inc., New York, N. Y. • Eagle-Ottawa Leather Company, Grand Haven, Michigan
The Lackawanna Leather Company, Hackettstown, N. J. • Radel Leather Manufacturing Company, Newark, N. J.

NOW...

CURTISS & SMITH SERVICE TOOLS

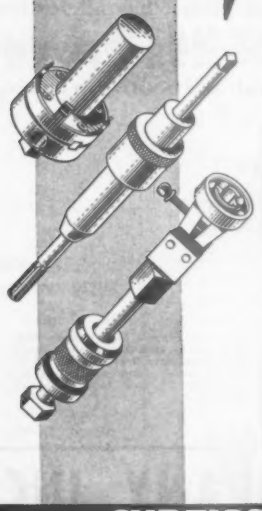
Coast to Coast

General Motors Service Tools

MANUFACTURED BY CURTISS & SMITH

AVAILABLE THRU THESE DISTRIBUTORS

Tools for servicing GMC Diesel Engines, GMC Hydraulic Transmissions and GMC Trucks and Coaches.



ALABAMA
Alabama Machinery & Supply Co.
110 Coosa Ave., Montgomery 1
Armstrong Equipment Co.
4601 First Ave., N., Birmingham

ARKANSAS—See Memphis, Tennessee

CALIFORNIA
Anderson-O'Brien Co.
746 E. Washington Blvd., Los Angeles 21
Crofton Diesel Engine Co.
Pt. of G St., Fishermen's Wharf, San Diego
Moore Equipment Company
North 99 Hgwy., Stockton
West Coast Engine & Equip. Co.
615 Ashby Ave., Berkeley 2

COLORADO
Colorado Builders' Supply Co.
1300 W. Evans St., Denver 9

CONNECTICUT—East—See Cambridge, Mass.
West—See College Point, L. I.

DELAWARE—See Philadelphia, Pa.

FLORIDA
General Truck Company
1638 W. Beaver, Jacksonville 3
Holzapfe GMC Truck & Equip. Co., Inc.
2100 NW 17th Ave., Miami 42

GEORGIA
North—Bialock Machinery & Equip. Co.
225 Forsythe St., SW, Atlanta
South—See Jacksonville, Florida

IDAHO—See Spokane, Wash.

ILLINOIS
V.P. Motor Truck Co. (North, Ill.)
909-11 S. Adams St., Peoria
Western Machinery & Engine Co. (South Ill.)
125 East McCord Street, Centralia

INDIANA
Flesch-Miller Tractor Co.
4611 Franklin Rd., Lawrence

KANSAS
Diesel Equipment Co.
355 N. Washington St., Wichita

KENTUCKY
Bogie Equipment Co.
801 E. 3rd St., Lexington 47

LOUISIANA
George Engine Company
630 Destrahan Ave., Harvey

MAINE—See Cambridge, Mass.

MARYLAND
Johnson & Towers Baltimore, Inc.
414 Key Highway, Baltimore 30

MASSACHUSETTS
Walter H. Moreton Corp.
9 Commercial Ave., Cambridge

MICHIGAN
Earle Equipment Company
6331-51 Tireman Ave., Detroit 4

MINNESOTA
Borebert-Ingersoll, Inc.
2161 University Ave., St. Paul 4

MISSISSIPPI
North—See Memphis, Tennessee
South—Kennedy Marine Engine Co.
Reynoir & Jackson Sts., Biloxi

MISSOURI
West—KC Diesel Power Co.
1711 Swift Ave., N. Kansas City
East—Western Machinery Co.
5075 Manchester Ave., St. Louis 10

NEBRASKA
Fahrs Tractor & Equip. Co.
1809-1811 Cuming St., Omaha 2

NEVADA
Clark County—See Los Angeles
See Stockton, Cal. for rest

NEW JERSEY
North—See College Point, L. I.
South—See Philadelphia, Pa.

NEW MEXICO
The Harry Cornelius Company
1510 N. 2nd St., Albuquerque

NEW YORK
Southeast—Henry Keese Marine Sales & Service, Inc.
27-16 122nd St., College Point, L. I.
West—Brock Tractor Corp.
1231 Seneca Ave., Buffalo
Central—L. B. Smith, Inc.
351 W. Fayette St., Syracuse 2

NORTH CAROLINA
E. F. Craven Company
601 Morehead Ave., Greensboro

OHIO
North—Great Lakes Diesel Co.
1064-66 W. 11th St., Cleveland 13
South—Central Ohio Tractor Co.
3850 E. 5th Ave., Columbus

OKLAHOMA
Diesel Power Company
1801 N. E. 9th St., Oklahoma City

OREGON
West—Gunderson Bros. Equip. Corp.
225 NW 14th Ave., Portland 9
East—See Spokane, Washington

PENNSYLVANIA
East—Johnson & Towers, Inc.
113-115 Market St., Philadelphia 6
West—Highway Equipment Co.
6465 Hamilton Ave., Pittsburgh 6

RHODE ISLAND—See Cambridge, Mass.

SOUTH CAROLINA
Van Lott, Inc.
420 Meeting St., West Columbia

TENNESSEE
West—Lewis-Diesel Engine Co.
92 W. Carolina St., Memphis 3
East—Nixon Mach. & Supply Co., Inc.
1300 Carter St., Chattanooga

TEXAS
Stewart & Stevenson Services
4516 Harrisburg Blvd., Houston

VERMONT—See Cambridge, Mass.

VIRGINIA
Bemiss Equipment Company
2219 Chamberlayne Ave., Richmond 22

WASHINGTON
West—Evans Engine & Equipment Co.
1230 Westlake Ave., N., Seattle 9
East—Modern Machinery Company
P. O. Box 2152, Spokane 2

WASHINGTON, D. C.—See Baltimore, Md.

WEST VIRGINIA—See Pittsburgh, Pa.

WISCONSIN
Drott Tractor Co., Inc.
3441 W. Wisconsin Ave., Milwaukee 8

ALASKA—See Seattle, Wash.

CURTISS & SMITH MFG. CORP.

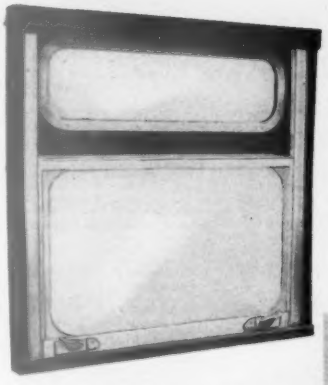
CURTISS & SMITH Engineered MAINTENANCE TOOLS Pottstown Pa.

POTTSTOWN, PA.

TRANSCO SASH

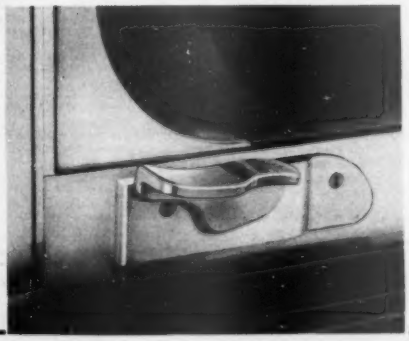
tested and proved over the years, is used by these famous makers

ACF-BRILL — Mack — White BUSSES



The latest full-floating TRANSCO SASH—the acme of simplicity. Not "adapted", but designed and built specifically for the Bus industry.

The industry-wide acceptance of TRANSCO'S dependable quality, design and construction is proven by recent deliveries to major transit companies from coast to coast. Transco Sash, made of extruded aluminum alloys, has all features of modern design. It is weathertight, rattle free, lightweight. Easy to operate with fingertip control; and positive in locking.



The new Transco Sash lock assembly is unique because the operating handle and cover plate is easily removed by taking out two screws. This allows replacement of lock bolt in a few seconds.

TRANSPORTATION SASH COMPANY, INC.

MANUFACTURERS OF TRANSCO SASH FOR THE TRANSPORTATION INDUSTRY

TOPTON, PENNSYLVANIA

WASHER BRUSHES

Like this, mean longer life for Your Paint Jobs They Cleanse without Abrasive Scrubbing—Harsh Solvents . . .

Washer Brushes on Whiting Washers are soft and gentle on your paint jobs—yet they have long, tough fibres for wear, and you gain a twofold benefit. Longer life for your paint jobs. Longer wearing brushes.

Another feature in Whiting Washer Brushes is the density control of each individual brush. Brushes properly staggered eliminate streaks. The Whiting Brush core is of molded plastic construction with ten slots in each core section so that individual replacements may be made in a matter of seconds. Fullergript brush strips make changeovers a simple operation.

ENGINEERED TO YOUR NEEDS

To meet your particular requirements, Whiting Bus Washers are available in a number of design variations—with side brushes only—or with side, eave, and roof brushes.

Mail the coupon, today!

*Reg. U. S. Pat. Off.

WHITING* **WASHERS FOR BUSES & TRUCKS**

Whiting Corporation,
15695 Lathrop Ave., Harvey, Illinois

Please send information on Whiting Brushes.

Name_____

Address_____

City_____ Zone____ State_____

★*As Advertised in* **TIME** *Magazine, June 18*

Comfort

IS OUR BUSINESS

When passengers on city service and intercity bus routes comment on the comfort of Heywood-Wakefield seats, we are pleased, but not surprised. After all, comfort has been our business ever since we started making furniture 125 years ago. As a result of this wealth of experience, you find that *all* Heywood-Wakefield products are nicely styled to make them as comfortable to live with as they are to use—and this includes household furniture as well as transportation and theatre seating and furniture for schools. Because we have always insisted on fine materials and skilled workmanship, you can be sure that *any* product bearing the Heywood-Wakefield trademark brings a full measure of value.

HEYWOOD-WAKEFIELD

125TH ANNIVERSARY

You Find This Familiar Trademark Wherever America

LIVES • TRAVELS • SEEKS AMUSEMENT • OR GOES TO SCHOOL

Theatre Chairs of exclusive "Airflo" and "Encore" designs are proving that comfortable seating is a profitable investment for theatre operators.

School Furniture of light weight, sturdy tubular steel assures long, satisfactory service in meeting the needs of America's schools and colleges.

Baby Carriages bearing the familiar Heywood-Wakefield emblem have been a first choice for styling, comfort and safety for generations.

Railroad Seats like this luxurious "Sleepy Hollow" model are a revenue-building choice on a growing number of leading railroads.

Bus Seats of Heywood-Wakefield scientific design make travel more comfortable on both city service and intercity routes of leading bus companies.

Household Furniture—Modern, Old Colony and all-purpose Ashcraft designs carry on the 125-year-old Heywood-Wakefield tradition of fine styling and sound construction.

HEYWOOD-WAKEFIELD COMPANY • *Gardner, Mass.* • *Serving America's Homes and the Public for 125 years*

In Canada—*Railway & Power Engineering Corporation, Limited, Toronto*

FUELS

METALS

RUBBER

TO SAVE

CRITICAL MATERIALS FOR DEFENSE MOBILIZATION...

... America needs more electric *public* transit vehicles, operating with *multi-passenger* efficiency. For example—economical, dependable *TROLLEY COACHES* ...

BUILT BY

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

CHICAGO • NEW YORK
CLEVELAND
WASHINGTON, D. C.
PITTSBURGH • BIRMINGHAM
SAN FRANCISCO

You'll feel safer...

...and BE safer...

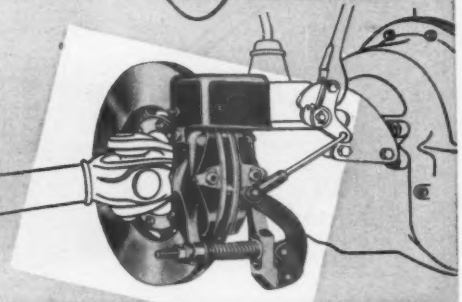
TRU-STOP is a ventilated, disc-type brake which attaches to the drive shaft of all trucks and buses. Hand-operated lever mechanism exerts equal and opposite pressure using entire surfaces of both shoes. Simplicity of TRU-STOP design permits adjustments, even relining, without dropping drive shaft.

TRU-STOP Brakes serve in an emergency, as an auxiliary brake on long downgrades, and as a positive parking brake. The smooth gripping action, the "feel" of deliberate deceleration when the brake is applied in a moment of emergency, makes the driver feel safer . . . makes the equipment safer. TRU-STOP Brakes are an investment in safety.

You can have TRU-STOP Brakes installed at the factory on your new bus or truck . . . or you or your local dealer can install them on your present equipment. TRU-STOP Brakes prevent accidents, eliminate road delays, reduce servicing costs. Is it worth the gamble *NOT* to install TRU-STOP Brakes?

See your dealer today or write for literature

with TRU-STOP *Emergency* BRAKES



ACCO

601 Stephenson Bldg., Detroit 2
2475 Porter Street, Los Angeles 21 • Bridgeport, Conn.

AUTOMOTIVE AND AIRCRAFT DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

"Intentionally Better" TRU-STOP *Emergency* BRAKES

BUS TRANSPORTATION

1951

BUYERS' GUIDE

An authoritative source of "where-to-buy" information on Bus Parts, Materials, Accessories, Shop Equipment and Tools will be found on the following pages.

This Buyers' Guide contains the names of more than 1,500 manufacturers and classifies some 300 products used by motor bus operators.

[* Manufacturers whose products are described in the advertising pages of this or previous issues during the past year.]

McGRAW-HILL PUBLISHING CO., INC. 330 W. 42nd St., New York 18, N. Y.

VEHICLE, BODY AND CHASSIS MANUFACTURERS

*ACF-Brill Motors Co., Philadelphia 42, Pa.
*Associated Equipment Co., Ltd., Southall, Middlesex, England
*Beaver Metropolitan Coaches, Inc., Beaver Falls, Pa.
*Beck & Co., C. D., Sidney, Ohio
Blue Bird Body Co., Fort Valley, Ga.
Carpenter Body Works, Mitchell, Ind., (Bodies)
*Checker Cab Mfg. Co., Kalamazoo, Mich.
Chevrolet Motor, Div. GMC, Detroit, Mich. (Chassis)
Corbitt Co., Henderson, N. C.
Crown Body Coach Corp., Los Angeles 21, Cal. (Bodies)
*Cub Industries, White Pigeon, Mich.
Dodge Brothers Corp., Detroit, Mich. (Chassis)
*Fitzjohn Coach Co., Muskegon, Mich.
*Flxible Co., Loudonville, Ohio
*General American Aerocoach Co., 135 S. LaSalle St., Chicago, Ill.
*G.M.C. Truck & Coach Div., G.M.C., Pontiac, Mich.
Hackney Bros., Inc., Wilson, N. C.
Hicks Body Co., Lebanon, Ind. (Bodies)
*Intercontinental Mfg. Co., 1819 Broadway, New York, N. Y.
*International Harvester Co., 108 N. Michigan Ave., Chicago 1, Ill. (Chassis)
*Kalamazoo Coaches, Inc., Kalamazoo, Mich.
*Leyland Motors, Ltd., Lancashire, England
*Mack Mfg. Corp., Empire State Bldg., New York 1, N. Y.
*Marmon-Herrington Co., Indianapolis 7, Ind.
*Metropolitan-Cammell-Weymann Motor Bodies, Ltd., Westminster, England
Oneida Products Corp., Canastota, N. Y.
Pacific Car & Foundry Co., Renton, Wash.
*Pullman Standard Car Mfg. Co., 79 E. Adams St., Chicago, Ill.
*Queen City Chevrolet Co., Cincinnati, Ohio
*Reo Motors, Inc., Lansing, Mich.
*St. Louis Car Co., St. Louis, Mo.
*Shop of Siebert, Inc., Toledo 2, Ohio
Southern Coach Mfg. Co., Evergreen, Ala.
*Superior Coach Corp., Lima, Ohio
Transicoach, Inc., Richmond, Ind.
*Transit Buses, Inc., Detroit 27, Mich.
*Twin Coach Co., Kent, Ohio
Union City Body Co., Union City, Ind. (Bodies)
Wayne Works, Richmond, Ind.
*White Motor Co., Cleveland 1, Ohio

ENGINES, MANUFACTURERS of

Air Cooled Motors, Inc., Syracuse, N. Y.
Buda Co., Harvey, Ill.
Chrysler Corp., Industrial Engine Div., Detroit 14, Mich.
Continental Motors Corp., Muskegon, Mich.
*Cummins Engine Co., Columbus, Ind.
Detroit Diesel Engine Div., General Motors Corp., Detroit 23, Mich.
*General Motors Truck & Coach Div. General Motors Corp., Pontiac, Mich.
*Hall-Scott Motor Car Co., Berkeley, Calif.
*Hercules Motors Corp., Canton 2, Ohio
*International Harvester Co., 108 N. Michigan Ave., Chicago, Ill.
LeRoi Co., Milwaukee, Wis.
Lycoming Div., Aviation Corp., Williamsport, Pa.
*Twin Coach Co., Kent, Ohio
*Waukesha Motor Co., Waukesha, Wis.

AIR CONDITIONING EQUIPMENT (For Buses)

Anemostat Corp. of America, 10 E. 39th St., New York 16, N. Y.
Carrier Corp., Syracuse 1, N. Y.
Frigidaire Div. General Motors Corp., Dayton 1, Ohio
*Tropic-Aire, Inc., 4501 W. Augusta Blvd., Chicago, Ill.
Trane Co., La Crosse, Wis.
York Corp., York, Pa.
*Vapor Heating Corp., Railway Exchange, Chicago 4, Ill.

AXLES, MANUFACTURERS of REAR

*Clark Equipment Co., Buchanan, Mich.
Eaton Mfg. Co., Cleveland 10, Ohio
*Timken-Detroit Axle Co., Detroit, Mich.

ACCESSORIES, PARTS AND SUPPLIES

ACETYLENE—See Oxygen and Gas, Compressed

ADVERTISING—See Cards, Car

AIR CLEANERS—See Cleaners, Air

AIR-SPRINGS—See Shock-Absorbers

ANTI-FREEZE

Commercial Solvents Corp., 17 E. 42nd St., New York, N. Y.
*du Pont de Nemours & Co., E. I., Wilmington, Del.
Hollingshead Corp., R. M. Camden, N. J.
National Carbon Co., 30 E. 42nd St., New York 17, N. Y. ("Prestone")
Penna. Refining Co., Cleveland 4, Ohio
Publicker Com'l Alcohol Co., Philadelphia, Pa.
*Socony-Vacuum Oil Co., 26 Broadway, New York, N. Y.
Stanley Co., J. T., 642 W. 30th St., New York 16, N. Y.
U. S. Industrial Chemicals, Inc., 60 E. 42nd St., New York 17, N. Y.

ANTI-GASSERS

Bludalk, Inc., 404 West St., New York, N. Y.
*Fargeol Co., R. D., Detroit, Mich.
*National Pneumatic Co., Boston, Mass.
*Zenith Carburetor Div., Bendix Aviation Corp., Detroit, Mich.

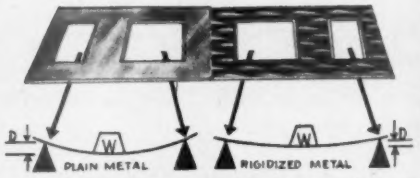
AXLES—See Shafts, Axle and Propeller

BATTERIES, STORAGE

*Auto-Lite Battery Corp., Toledo 1, Ohio
*Bowers Battery & Spark Plug Co., Reading, Pa.
Carlile & Doughty, Inc., Conshohocken, Pa.
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
Edison, Inc., Thos. A., West Orange, N. J.
*Electric Storage Battery Co., Philadelphia 32, Pa.
Firestone Battery Co., Akron 17, Ohio
General Tire & Rubber Co., Akron, Ohio
Globe-Union, Inc., Milwaukee, Wis.
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron, Ohio
Gould Storage Battery Corp., Depew, N. Y.
Hicks Battery Co., Columbus, Ga.
Hobbs Battery Co., San Francisco, Calif.
*National Battery Co., St. Paul, Minn.
Prest-O-Lite Battery Co., Indianapolis, Ind.
Surrette Storage Battery Co., Salem, Mass.
Vesta Consolidated, Inc., 400 W. Madison St., Chicago, Ill.
*Willard Storage Battery Co., Cleveland 1 Ohio
Wiltherbee Storage Battery Co., Hamburg Pa.

Continued on next page

Why not CONSERVE METAL by SAVING WEIGHT with ADDED STRENGTH?



(Rigidized metal 6 WL has an increase in Flexural rigidity (D=Deflection) in excess of 50% over plain metals)

Rigidized DESIGN STRENGTHENED **Metals**

Why use a heavy gage metal when a lighter one will do the same job and thus help you CONSERVE CRITICAL ALLOYS? With the increased strength-weight ratios made possible with RIGIDIZED METALS, gage reductions are most practical. These three-dimensional design-strengthened metals provide a redistribution of metal throughout the cross-section that results in increased flexural rigidity (as illustrated), including buckling strength and increased impact resistance.

RIGIDIZED METAL reduces maintenance costs because of its scratch-resistant, dent-resistant surfaces. Its added rigidity withstands rugged treatment, its lighter weight makes it valuable to the automotive and aeronautical fields. RIGIDIZED METALS are, for example, used in helicopters, aircraft integral ramps, truck body panels, interior car trim, and for many other automotive and aircraft applications.

Send for your copy of the RIGIDIZED METALS IDEA Handbook TODAY

Rigidized Metals Corporation

672 OHIO STREET BUFFALO 3, NEW YORK

1951 Buyers' Guide

Continued from page 195

BEARINGS and BUSHINGS, BRONZE BRONZE-BACKED and DIE CAST

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
Automotive Products Corp., Cincinnati 25, Ohio
Bohn Aluminum & Brass Corp., Holland, Mich.
Bunting Brass & Bronze Co., Toledo, Ohio
*Cleveland Graphite Bronze Co., Cleveland 3, Ohio
*Federal-Mogul Corp., Detroit 13, Mich.
Gardiner Metal Co., 2514 W. 48th Pl., Chicago, Ill.
Johnson Bronze Co., New Castle, Pa.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Morris Co., J. Leslie, Los Angeles 33, Calif.
Phosphor Bronze Smelting Co., Philadelphia, Pa.
Thompson Products, Inc., Cleveland 3, Ohio

BEARINGS, BALL

Aetna Ball Bearing Mfg. Co., 4600 Schubert Ave., Chicago 39, Ill.
Ahlberg Bearing Co., 3025 W. 47th St., Chicago, Ill.
Ball & Roller Bearing Co., Danbury, Conn.
Bantam Bearings Corp., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Federal Bearings Co., Poughkeepsie, N. Y.
General Motive Parts Co., 160 W. 62nd St., New York, N. Y.
Hoover Ball Bearings Co., Ann Arbor, Mich.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Norma-Hoffman Bearings Corp., Stamford, Conn.
S.K.F. Industries, Inc., Philadelphia 34, Pa.
Torrington Co., Torrington, Conn.

BEARINGS, ROLLER

Bearings Co. of America, Lancaster, Pa.
Bantam Bearings Corp., South Bend, Ind.
Bower Roller Bearings Co., Detroit 14, Mich.
*Federal Mogul Service (Bower)
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Orange Roller Bearing Co., Orange, N. J.
Raritan Bearing Corp., Trenton 4, N. J.
Roller Bearing Co. of America, Trenton, N. J.
Shafer Bearing Corp., 35 E. Wacker Dr., Chicago, Ill.
S.K.F. Industries, Inc., Philadelphia 34, Pa.
*Timken Roller Bearing Co., Canton 6, Ohio
Tyson Bearing Corp., Massillon, Ohio

BELLS and BUZZERS, PASSENGER SIGNAL—See Signals, Passenger Stop

BELTS, FAN

*American Brake Shoe Co., American Brakeblok Div., Detroit, Mich.
Atlas Asbestos Co., N. Wales, Pa.
Continental Rubber Works, Erie, Pa.
*Dayton Rubber Mfg. Co., Dayton, Ohio
*Firestone Tire & Rubber Co., Akron, Ohio
*Gates Rubber Co., Denver 17, Colo.
Gilmor Co., L. H., Div. U. S. Rubber Co., Philadelphia 35, Pa.
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio
Graton & Knight Co., Worcester 4, Mass.
*Grey-Rock Div., Raybestos-Manhattan, Manheim, Pa.
Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic, N. J.
*Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn.
Russell Mfg. Co., Middletown, Conn.
*Thermoid Co., Trenton, N. J.

BLOCK, BRAKE—See Lining and Blocks, Brake

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

BOXES, FARE—See Registers and Devices, Fare Collecting

BRAKES, AIR, HYDRAULIC and VACUUM

Aireon Corp., Kansas City, Kan.
*American Chain & Cable Co., Auto & Aircraft Div., Detroit, Mich.
Auto Specialty & Mfg. Co., St. Joseph, Mich.
Bendix Products Div. Bendix Aviation Corp., South Bend, Ind.
*Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio
Detroit Duo Grip Brake Co., Detroit, Mich.
Edelmann & Co., E. 2322 W. Logan Blvd., Chicago, Ill.
Empire Electric Brake Co., Newark 7, N. J.
Lambert Disc Brakes Div., Auto Specialties Mfg. Co., Hartford, Mich.
Lean Co., San Francisco, Calif.
*Midland Steel Products Co., Detroit, Mich.
New York Air Brake Co., 420 Lexington Ave., New York, N. Y.
*Timken-Detroit Axle Co., Ashtabula, Ohio
Vickers, Inc., Detroit 32, Mich.
*Wagner Elec. Corp., St. Louis 14, Mo.
Warner Electric Brake Mfg. Co., Beloit, Wis.

BRAKE-FLUID—See Fluid, Hydraulic Brake

BUSHINGS—See Bearings and Bushings

BUZZERS—See Signals; Passenger Stop

CABINETS, FIRST AID—See Kits, First Aid

CABLE IGNITION, STARTING, LIGHTING

American Enameled Magnet Wire Div. Electric Auto-Lite Co., Fort Huron, Mich.
Belden Mfg. Co., 4689 W. Van Buren St., Chicago, Ill.
Caldwell Industries, Kent, Ohio
Crescent Co., Pawtucket, R. I.
*Electric Auto-Lite Co., Toledo 1, Ohio
General Electric Co., Bridgeport, Conn.
Kerite Co., 30 Church St., New York, N. Y.
Okonite Co., Passaic, N. J.
P & D Mfg. Co., Long Island City, N. Y.
*Packard Electric Div. General Motors Corp., Warren, Ohio
Rockbestos Products Corp., New Haven 4, Conn.
Standard Motors Products, Inc., Long Island City, N. Y.
Whitaker Battery Supply Co., Kansas City, Mo.
*Willard Storage Battery Co., Cleveland 1, Ohio

CARBURETORS

Bendix Products Corp., Stromberg Carburetor Div., South Bend, Ind.
Carter-Carburetor Corp., St. Louis 7, Mo.
Chandler Evans Co., Meridan, Conn.
Ensign Carburetor Co., Huntington Park, Calif.
Exola Products Co., Los Angeles 11, Cal.
Holley Carburetor Co., Detroit, Mich.
*Zenith Carburetor Div. Bendix Aviation Corp., Detroit, Mich.

CARDS, CAR

Car-Cards, Inc., 415 Lexington Ave., New York City, N. Y.
Chicago Car Advertising Co., 333 N. Michigan Ave., Chicago, Ill.
Loomis Advertising Co., St. Louis 1, Mo.
National Transitads, 400 N. Michigan Ave., Chicago, Ill.
Nation Wide Bus Advertising Inc., 230 E. 42 St., New York City, N. Y.
Reid Jr., Inc. Harry, Indianapolis, Ind.
WLW Promotions, Inc., Div. of Crosley Corp., Dayton 3, Ohio

CASTINGS, CYLINDER SLEEVE (For Repairs)

Eagle Machine Co., Indianapolis, Ind.
*Hunt Spiller Mfg. Corp., Boston, Mass.
McQuay-Norris Mfg. Co., St. Louis, Mo.
*Sealed Power Corp., Muskegon, Mich.
Thompson Products, Inc., Cleveland 3, Ohio
*Toledo Steel Products Co., Toledo 1, Ohio

CEMENT, GASKET

Cabot, Inc., Samuel, Boston, Mass.
Durkee-Atwood Co., Minneapolis, Minn.
Hollingshead Corp., R. M. Camden, N. J.
Miller Mfg. Co., Camden, N. J.
Pep Mfg. Co., 33 W. 42nd St., New York, N. Y.
Permatex Co., Brooklyn 35, N. Y.
Stanley Co., John T., 642 W. 30th St., New York 16, N. Y.
Wilbur & Williams Co., Boston, Mass.
Zip Abrasive Co., Cleveland, Ohio

CHAINS, TIMING

Baldwin-Duckworth Div. Chain Belt Co., Springfield, Mass.
D & B Mfg. Co., 2335 S. Michigan Ave., Chicago 1, Ill.
*Hoof Products Co., 6543 S. Laramie Ave., Chicago 38, Ill.
Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.
Morse Chain Co., Ithaca, N. Y.
Whitney Chain & Mfg. Co., Hartford, Conn.

CHAINS, TIRE and ANTI-SKID

*American Chain & Cable Co., York, Pa.
Bridgeport Chain & Mfg. Co., Bridgeport, Conn.
Cleveland Chain & Mfg. Co., Cleveland, Ohio
Columbus-McKinnon Chain Corp., Tonawanda, N. Y.
Hodell Chain Co., Cleveland, Ohio
International Chain & Mfg. Co., York, Pa.
*McKay Co., Pittsburgh 22, Pa.
Round California Chain Mfg. Co., So. San Francisco & Los Angeles 4, Cal.
Round Chain Mfg. Co., Chicago 6, Ill.
Seattle Chain Mfg. Co., Seattle 8, Wash.
Southern Chain & Mfg. Co., Birmingham 5, Ala.
Taylor Chain Co., S. G., Hammond, Ind.
*Tropic-Aire, Inc., 4501 W. Augusta Blvd., Chicago, Ill.
*Western Chain Prod. Co., 1809 W. Belmont, Chicago, Ill.
Woodhouse Chain Works, Trenton 7, N. J.

CHANNELS, FELT

American Felt Co., Glenville, Conn.
Armstrong Cork Co., Lancaster, Pa.
Booth Felt Co., Brooklyn, N. Y.
Felters Co., Boston, Mass.

BRUNNER SINCE 1906 AIR COMPRESSORS

"We have always felt that Brunner Air Compressors offered the biggest dollar value in performance, dependability and service life but...

don't take our word for it...

Most Brunner customers 'sold' themselves by making point by point comparisons. Obviously, we'd like to see you depending upon Brunner Compressed Air too and for that reason invite your request for a Brunner catalog as the first step in getting acquainted."

J. W. THOMAS
Sales Manager

A. D. SULLIVAN
Chief Engineer

SEND IT. I'd like to see and read the reasons why Brunner Air Compressors are so popular with other men responsible for watching costs as well as the efficient maintenance and service of bus fleets.

Name

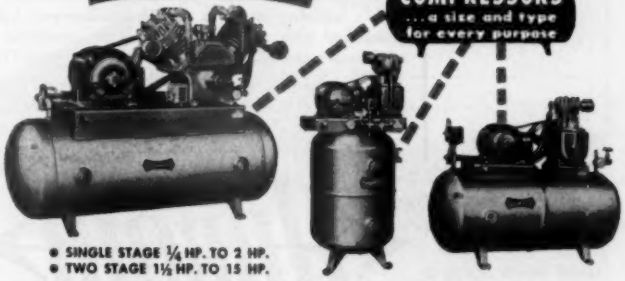
Company

Address City and State

BRUNNER MANUFACTURING COMPANY, UTICA 1, NEW YORK, U. S. A.

BRUNNER SINCE 1906

AIR COMPRESSORS ...a size and type for every purpose



• SINGLE STAGE ¼ HP. TO 2 HP.
• TWO STAGE 1½ HP. TO 15 HP.

BRUNNER AIR COMPRESSORS *have been in automotive service for 45 years.*

Felt Products Mfg. Co., 1504 Carroll Ave., Chicago 7, Ill.
Hamilton-Wade Co., Brocton, Mass.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Western Felt Works, 4117 Ogden Ave., Chicago 23, Ill.

CHANNELS, METAL

Cowles & Co., New Haven, Conn.
Kirk & Blum Mfg. Co., Cincinnati 25, Ohio
Motor Products Corp., Detroit, Mich.

CHANNELS, RUBBER

Bridgeport Fabrics, Inc., Bridgeport, Conn.
Dryden Rubber Co., 1014 S. Kildare Ave., Chicago, Ill.
*Inland Mfg. Co., Dayton, Ohio
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, Ohio
Sponge Rubber Prod. Co., Derby, Conn.

CIRCUIT BREAKERS

*Rohden Mfg. Co., 4739 Montrose Ave., Chicago 41, Ill.

CLAMPS, HOSE

American Stamping Co., Battle Creek, Mich.
*Breeze Corp., Newark, N. J.
Ideal Corp., 435 Liberty Ave., Brooklyn, N. Y.
Marman Products Co., Inglewood, Calif.
Screw Machine Products Co., Providence, R. I.
Tinnerman Products, Inc., Cleveland 13, Ohio
Universal Industrial Corp., Hackensack, N. J.
Washburn Co., Worcester, Mass.
Wittek Mfg. Co., 4305 W. 24th Pl., Chicago, Ill.

CLARIFIERS, OIL—See Filters, Oil

CLEANERS, AIR

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
Air-Maze Corp., Cleveland 5, Ohio
Burgess Battery Co., 500 W. Huron St., Chicago, Ill.
Donaldson Co., St. Paul, Minn.
Michiana Products Corp., Michigan City, Ind.
United Air Cleaner Co., 9705 Cottage Grove Ave., Chicago, Ill.
Vortox & Co., Claremont, Calif.

CLUTCHES—See Facings, Clutch

Real stoppers, these!

Big and bright, they're perfect for emergency vehicles . . . fire apparatus, police cars, snowplows. Like all Arrow *safety after dark* equipment, they're dependable . . . built for long, trouble-free performance.

Reflecting surfaces are plated and highly polished. Rims and bases are finished with baked-on enamel over bonderized steel. Effective lens diameter is 6⅛"; lettering is ⅜" x 2". 21 candlepower bulbs furnished with all models. Lenses are available in red, amber and blue, with or without the word STOP.

See your jobber salesman today about Arrow Emergency Lights and Arrow's complete line of lighting equipment . . . headlights, marker lights, directional signals, reflectors, mirrors and flares.

safety after dark

ARROW SAFETY DEVICE CO.
MOUNT HOLLY, NEW JERSEY

ARROW

COILS, IGNITION

American Bosch Corp., Springfield, Mass.
Automotive Specialty Corp., Brooklyn, N. Y.
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
Echlin Mfg. Co., New Haven 5, Conn.
*Electric Auto-Lite Co., Toledo 1, Ohio
Kem Mfg. Co., 601 W. 26th St., New York 1, N. Y.
Mallory Electric Co., Detroit 4, Mich.
Niehoff & Co., C. E., 4925 W. Lawrence Ave., Chicago, Ill.
P & D Mfg. Co., Long Island City, N. Y.
Standard Motor Products, Inc., Long Island City, N. Y.

COLLECTORS, FARE—See Registers and Devices, Fare Collecting

COMMUNICATION—See Radio and Accessories, Mobile

COMPOUNDS, PARTS CLEANING—See Solutions, Parts Cleaning

COMPOUNDS, RADIATOR CLEANING

Hollingshead Corp., R. M. Camden, N. J.
Hygienic Products Co., Canton, Ohio
Lusk Co., C. F., Cleveland, Ohio
*Magnus Chemical Co., Garwood, N. J.
Magnuson Prod. Corp., Brooklyn, N. Y.
Miller Mfg. Co., Camden, N. J.
*Oakite Products, Inc., 22 Thames St., New York 6, N. Y.
Penn Salt Mfg. Co., Philadelphia, Pa.
Petroleum Solvents Corp., 331 Madison Ave., New York 17, N. Y.
Radiator Specialty Co., Charlotte, N. C.

COMPOUNDS, UPHOLSTERY CLEANING

Fayette Chemical Co., Uniontown, Pa.
*Magnus Chemical Co., Garwood, N. J.
*Oakite Products, Inc., 22 Thames St., New York 6, N. Y.
Sno-Flake Products Co., Detroit, Mich.

COMPOUNDS, VALVE GRINDING

Carborundum Co., Niagara Falls, N. Y.
Clover Mfg. Co., Norwalk, Conn.
Pep Mfg. Co., 33 W. 42nd St., New York 18, N. Y.
Zip Abrasive Co., Cleveland, Ohio

CONTROLS, CHOKE

Arens Controls, 2550 S. Halsted St., Chicago, Ill.
Bendix Products Corp., Stromberg Carburetor Div., South Bend, Ind.
Pierce Governor Co., Anderson, Ind.
Shakespeare Products Co., Kalamazoo, Mich.

CONTROLS, DASH

Arens Controls, 2550 S. Halsted St., Chicago, Ill.
Imperial Brass Mfg. Co., 1220 W. Harrison St., Chicago 7, Ill.
Richland Auto Parts Co., Mansfield, Ohio

CONTROLS, DOOR—See Operators, Pneumatic Door

CONTROLS, ENGINE HEAT—See Thermostats, Water Circulating—also Shutters, Radiator

CONTROLS, FUEL-FILLING

Modern Auto Supply Co., Syracuse, N. Y.
Protectoseal Co., 1958 S. Western Ave., Chicago 7, Ill.

COVERINGS, FLOOR

Acme Asbestos Covering & Flooring Co., 1200 W. Fulton St., Chicago 7, Ill.
*Aluminum Co. of America, Pittsburgh 19, Pa. (Matting)
American Mat Corp., Toledo, Ohio
Armstrong Cork Co., Lancaster, Pa. (Armoflor, Automat, Linoleum, Traffex)
Bird & Son, Inc., Walpole, Mass.
Congoleum-Nairn, Inc., Kearney, N. J. (Congoleum)
*Goodrich Co., B. F., Akron 18, Ohio
Goodyear Tire & Rubber Co., Akron, Ohio
*Johns-Manville, 22 E. 40th St., New York 16, N. Y. (Composition)
Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic, N. J.

Note—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

*Melflex Products Co., Akron 8, Ohio
*Moore & Co., Sam, Mantua, Ohio
*Paraffine Companies, San Francisco, Calif.
Sloan, W. & J., 5th Ave. & 47th St., New York, N. Y. (Carpet)
Tuco Products Corp., 30 Church St., New York, N. Y. (Composition)
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y. (Rubber Matting)

CRANKSHAFTS, FINISHED

Ohio Crankshaft Co., Cleveland, Ohio
Permalux Co., 900 W. Lake St., Chicago, Ill.
Wyman Gordon Co., Worcester, Mass.

DECALCOMANIAS

American Decalcomania Co., 4326-5th Ave., Chicago 24, Ill.
Excello Specialties Co., Cleveland, Ohio
*Meyercord Co., 5323 W. Lake St., Chicago 44, Ill.
Palm Bros. Co., Cincinnati 12, Ohio
Palm Fechteler & Co., 220 W. 42nd St., New York 18, N. Y.
Permalux Co., Aurora, Ill.

DEGASSERS—See Anti-Gassers

DESCALERS

American Sand-Banum Co., 9 Rockefeller Plaza, New York, N. Y.
Butler Engineering Co., New Orleans, La.
Electromotive Industries, Inc., Louisville, Ky.
Stanley Co., John T., 642 W. 30th St., New York 16, N. Y.

DIFFERENTIALS—See Gears, Differential

DOORS, AIR OPERATED—See Operators, Pneumatic Door

DRUMS, BRAKE

Christiana Machine Co., Christiana, Pa.
Copperweld Steel Co., Glassport, Pa.
Dayton Steel Fdry. Co., Dayton 1, Ohio
Eaton Mfg. Co., Cleveland 10, Ohio
Erie Malleable Iron Co., Erie, Pa.
Frank Foundries Corp., Moline, Ill.
General Foundry & Mfg. Co., Flint, Mich.
*Gunite Foundries Corp., Rockford, Ill.
*Hunt-Spiller Mfg. Corp., Boston, Mass.
Lempco Products, Inc., Bedford, Ohio
Motor Wheel Corp., Lansing, Mich.
Reynolds Mfg. Co., Springfield, Mo.
*Timken-Detroit Axle Co., Ashtabula, Ohio
Truscon Steel Corp., Cleveland, Ohio

ENAMEL—See Paint, Enamel and Lacquer

EXTINGUISHERS, FIRE

American-La France-Foamite Corp., Elmira, N. Y.
Ansul Chemical Co., Marinette, Wis.
AutoFyrstop Co., Philadelphia, Pa.
Bean Mfg. Co., John, Lansing, Mich.
Buffalo Fire Appliance Corp., Dayton, Ohio
Fyr-Fyter Co., Dayton, Ohio
General Detroit Corp., Detroit 7, Mich.
Kidde & Co., Walter, Bloomfield, N. J.
National Fire Extinguisher Co., 50 Rockefeller Plaza, New York 19, N. Y.
*Pyrene Mfg. Co., Newark 3, N. J.
Randolph Laboratories, Inc., 3 E. Kinzie St., Chicago 11, Ill.
Will-x Mfg. Corp., Brooklyn, N. Y.

FABRICATIONS—See Panels

FABRICS, UPHOLSTERY—See also Leather, Artificial

Burlington Mills Corp., 350 Fifth Ave., New York, N. Y.
*Chicopee Mfg. Corp., 47 Worth St., New York 13, N. Y.
*Collins & Aikman Corp., 200 Madison Ave., New York, N. Y.
*Goodall Fabrics, Inc., 525 Madison Ave., New York, N. Y.
Massachusetts Mohair Plush Co., 80 E. Jackson Blvd., Chicago, Ill.
Susquehanna Mills, Inc., 404 Fourth Ave., New York, N. Y.

FACINGS and PLATES, CLUTCH

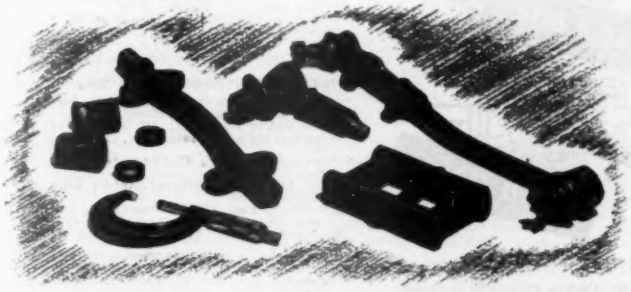
Accurate Parts Mfg. Co., Cleveland, Ohio
*American Brake Shoe Co., American Brakeblok Div., Detroit, Mich.
Borg & Beck Div., Borg-Warner Corp., 6558 S. Menard Ave., Chicago, Ill.
*Cleveland Graphite & Bronze Co., Cleveland 10, Ohio
Fibre & Metal Products, Inc., Downey, Calif.
General Metals Powder Co., Akron, Ohio
*Grey-Rock Div., Inc., Raybestos-Manhattan, Manheim, Pa.
*Johns-Manville, 22 E. 40th St., New York 16, N. Y.
*Lipe-Rollway Corp., Syracuse, N. Y.
*Long Mfg. Div. Borg-Warner Corp., Detroit, Mich.
*Monmouth Products Co., Cleveland 3, Ohio
*Raybestos Div. Raybestos-Manhattan, Inc., Bridgeport, Conn.
Russell Mfg. Co., Middletown, Conn.
*Thermoid Co., Trenton, N. J.
*Wagner Electric Corp., St. Louis 14, Mo.
Wellman Co., S. K., Cleveland, Ohio

FANS, VENTILATING

Continental Screw Co., New Bedford, Mass.
Corbin Screw Corp., New Britain, Conn.
Diehl Mfg. Co., Elizabeth, N. J.
Evans Products Co., Detroit 27, Mich.
Excell Auto Radiator Co., 320 E. 21st St., Chicago, Ill.
Hans Industries, Edmund, Detroit 4, Mich.
Lydon-Bricher Mfg. Co., St. Paul, Minn.
Samson United Corp., Rochester, N. Y.
Sturtevant Div., Westinghouse Elec. Corp., Boston 36, Mass.

FASTENERS

American Screw Co., Providence, R. I. (Phillips)
Boots Aircraft Nut Corp., New Canaan, Conn.
Camloc Fastener Co., 420 Lexington Ave., New York, N. Y.
Cherry Rivet Co., 231 Winslow St., Los Angeles 13, Calif.
Dzus Fastener Co., Babylon, N. Y.
Elastic Stop Nut Corp., Union, N. J.
Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Russell, Birdsal & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Mfg. Co., Waterbury, Conn.
Shakeproof, Inc., 2565 N. Beeler Ave., Chicago 39, Ill.
South Chester Corp., Philadelphia 2, Pa.



In Chassis Parts...Master Automotive Mechanics Prefer MONMOUTH for Savings and Safety

YOU save time in installation with Monmouth Chassis Parts. They are machined to close tolerances from correct analysis steel and heat treated to meet original equipment specifications.

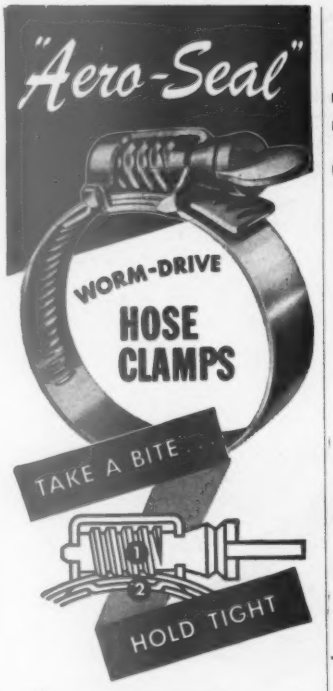
The line is complete. It includes king bolt sets, shackles, tie rod ends and drag links, tie rod and drag link assemblies, knee-action coil springs, and independent front wheel suspension parts.

N. A. P. A. Jobbers coast to coast give Minute-Man service on the Monmouth line.

FREE FRONT END CHART
Wall size. Date on all popular cars.

Name_____
Street_____
City_____ State_____
Write to

THE CLEVELAND GRAPHITE BRONZE CO.
REPLACEMENT SALES DIVISION
6545 Carnegie Ave. • Cleveland 3, Ohio



❶ At least 3 hardened steel threads always engaged in worm drive action in slotted band.
Clamp unscrews easily but will never work loose.

❷ Worm threads cannot touch or damage hose—curved saddle assures uniform sealing pressure around complete circumference.

- Long Life — use again and again
- Integral construction — no parts to lose
- Stainless steel bands resist corrosion
- Two types—screwdriver slot or thumb grip

WRITE TODAY for **FREE SAMPLE**

ANOTHER BREEZE MARK PRODUCT

"Aero-Seal"®
HOSE CLAMPS

BREEZE CORPORATIONS, INC.

26 South Sixth Street, Newark, N. J.

•Standard Pressed Steel Co., Jenkintown, Pa.
Tinnerman Products Inc., Cleveland 13, Ohio
United-Carr Fastener Corp., Cambridge, Mass.

FILL SIGNALS—See Signals, Fill

FILLINGS, SEAT—See Seats, Spring or Rubber Cushions for

FILTERS, LUBRICATING and FUEL OIL
•A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
American Bosch Corp., Springfield, Mass.
Briggs Clarifier Co., Washington, D. C.
Cuno Engineering Corp., Meriden, Conn.
•DeLuxe Products Corp., La Porte, Ind.
Edde Mfg. Co., Milwaukee, Wis.
•Fram Corp., Providence, R. I.
Klemm Automotive Products Co., 1718 N. Damen Ave., Chicago, Ill.
Luber-Finer, Inc., Los Angeles 7, Calif.
Michiana Products Corp., Michigan City, Ind.
Motor Economy Products, Inc., 107 W. 36th St., New York 18, N. Y.
Oil Purifier, Inc., Oakland, Calif.
Olixir Products, Inc., Buffalo, N. Y.
Pick Mfg. Co., West Bend, Wis.
Purolator Products, Inc., Newark, N. J.
Rega Mfg. Co., Rochester, N. Y.
Skinner Purifiers, Inc., Detroit, Mich.
Walker Mfg. Co., Racine, Wis.
•W G B Oil Clarifier, Inc., Kingston, N. Y.
Winslow Engineering Co., Oakland 8, Calif.
•Wix Accessories Corp., Gastonia, N. C.

FIXTURES and FITTINGS, LAMPS (Interior)
•ACF-Brill Motors Co., Philadelphia, Pa.
•Adams & Westlake Co., Elkhart, Ind.
•Arrow Safety Device Co., Mt. Holly, N. J.
Columbus Metal Products, Inc., Columbus, Ohio
•Electric Service Mfg. Co., Philadelphia 32, Pa.
•Guide Lamp Div. General Motors Corp. Anderson, Ind.
•Luminator, Inc., 120 N. Peoria St., Chicago, Ill.
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
Rosen & Co., A. W., 1801 First Ave., New York, N. Y.
Visionator, Inc., 120 W. Peoria St., Chicago, Ill.

FLARES, HIGHWAY
Anther Force Oiler Co., Ft. Madison, Iowa
•Arrow Safety Device Co., Mt. Holly, N. J.
Bolser Corp., Cedar Falls, Iowa
•Dietz Co., R. E., Syracuse, N. Y.
Economy Electric Lantern Co., Milwaukee 8, Wis.
Grote Mfg. Co., Bellevue, Ky.
K-D Lamp Co., Cincinnati, Ohio
Kilbourn-Sauer Co., Fairfield, Conn.
Miro-Flex Co., Wichita, Kan.
U-C Lite Mfg. Co., 11 E. Hubbard St., Chicago 11, Ill.
U. S. Electric Mfg. Corp., 222 W. 14th St., New York 11, N. Y.

FLOORS, BUS—See Coverings, Floor

FLUID, HYDRAULIC BRAKE
•Moraine Prods. Div., General Motors Corp., Dayton, Ohio
Permatex Co., Brooklyn 35, N. Y.
Puritan Co., Rochester, N. Y.
Wagner Electric Corp., St. Louis, Mo.
Warner Gear Div., Borg-Warner Corp. Muncie, Ind.

FUEL and LUBRICANTS
American Oil Co., Baltimore, Md.
Ashland Oil Refining Co., Ashland, Ky.
•Cities Service Co., 60 Wall Tower, New York, N. Y.
Continental Oil Co., Ponca City, Okla.
Ethyl Gasoline Corp., Chrysler Bldg., New York, N. Y.
Freedom-Valvoline Oil Co., Freedom, Pa.
•Gulf Oil Corp., Pittsburgh 30, Pa.
Kendall Refining Co., Bradford, Pa.
MacMillian Petroleum Corp., Los Angeles, Cal.
Mid Continent Petroleum Corp., Tulsa, Okla.
New York & New Jersey Lubricating Co., 292 Madison Ave., New York, N. Y.
Ohio Oil Co., Findlay, Ohio
Penna Refining Co., Cleveland 4, Ohio
Pennzoil Co., Oil City, Pa.
Phillips Petroleum Co., Bartlesville, Okla.

Note—•More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

Budd Wheel Distributors

provide the same service described in this advertisement

AKRON—Motor Rim Manufacturers Co.
ALBANY—Wheels, Incorporated
ALBUQUERQUE—Wheels & Brakes, Inc.
ATLANTA—Harris Automotive Service, Inc.
BALTIMORE—R. W. Norris & Sons, Inc.
BIRMINGHAM—Wheel Rim & Parts Co.
BOSTON—New England Wheel & Rim Co.
BUFFALO—Fray, the Wheelman, Inc.
CHARLOTTE—Carolina Rim & Wheel Co.
CHATTANOOGA—Harris Automotive Service, Inc.
CHICAGO—Stone Wheel, Inc.
CINCINNATI—Rim & Wheel Service, Inc.
CLEVELAND—Motor Rim Manufacturers Co.
COLUMBUS—Hayes Wheel & Spring Service
DALLAS—Southwest Wheel, Inc.
DAVENPORT—Stone Wheel, Inc.
DAYTON—Rim & Wheel Service, Inc.
DENVER—Quinn & McGill Motor Supply Co.
DES MOINES—Des Moines Wheel & Rim Co.
DETROIT—H. & H. Wheel Service, Inc.
EVANSVILLE—Auto Wheel & Rim Service Co., Inc.
FARGO—Wheel Service Company
FORT WAYNE—Wheel & Rim Sales Co.
GRAND RAPIDS—Rim & Wheel Service Co.
HARRISBURG—Standard Rim & Wheel Co.
HARTFORD—Connecticut Wheel & Rim Co.
HOUSTON—Southwest Wheel & Equipment
INDIANAPOLIS—Indiana Wheel & Rim Co.
JACKSONVILLE—Southeast Wheel & Rim Co.
KANSAS CITY—Borbein, Young & Co.
KNOXVILLE—Harris Automotive Service, Inc.
LOS ANGELES—Wheel Industries, Inc.
LOUISVILLE—Auto Wheel & Rim Service
MEMPHIS—Beller Wheel, Brake & Supply Co.
MILWAUKEE—Stone Manufacturing Co.
MOLINE—Mutual Wheel Co.
NASHVILLE—Beller Wheel, Brake & Supply Co.
NEWARK—Automotive Safety Inc.
NEW HAVEN—Connecticut Wheel & Rim Co.
NEW ORLEANS—Southern Wheel & Rim Co.
NEW YORK—Wheels, Incorporated
OKLAHOMA CITY—Southwest Wheel, Inc.
OMAHA—Morgan Wheel & Equipment Co., Inc.
PEORIA—Peoria Wheel & Rim Co.
PHILADELPHIA—Thomas Wheel & Rim Company
PITTSBURGH—Wheel & Rim Sales Co.
PORTLAND—Six Robblees', Inc.
PROVIDENCE—New England Wheel & Rim Company
RALEIGH—Carolina Rim & Wheel Co.
RICHMOND—Dixie Wheel Co., Inc.
ROCHESTER—Fray, the Wheelman, Inc.
SALT LAKE CITY—Henderson Rim & Wheel Service
SAN ANTONIO—Southwest Wheel & Equipment
SAN FRANCISCO—Wheel Industries, Inc.
SEATTLE—Six Robblees', Inc.
SOUTH BEND—Wire & Disc Wheel Sales & Service
SPOKANE—Bearing & Rim Supply Co.
SPRINGFIELD, ILL.—Illinois Wheel & Brake Co.
SPRINGFIELD, MO.—Borbein, Young & Co.
ST. LOUIS—Borbein, Young & Co.
ST. PAUL—Wheel Service Co.
SYRACUSE—Colbourn Wheel & Rim Service, Inc.
TACOMA—Six Robblees', Inc.
TOLEDO—Wheel & Rim Sales Co.
WICHITA—Borbein, Young & Co.

EXPORT
CLEVELAND—C. O. Brandes, Inc.

CANADA
CALGARY—Fisk Tire Service Ltd.
EDMONTON—Alberta Wheel Distributors, Ltd.
MONTREAL—General Automotive Equipment Ltd.
TORONTO—Wheel & Rim Co. of Canada, Ltd.
VANCOUVER—Wheels & Equipment, Ltd.
WINNIPEG—Ft. Gary Tire Service Ltd.

TOPS FOR SHOP EXCELLENCE FOR TWO YEARS IN A ROW!

ALTON BOX BOARD COMPANY

MANUFACTURERS
PAPER BOX BOARD
ALTON, ILL.

The Budd Company,
12141 Charlevoix Ave.,
Detroit 14, Mich.

Gentlemen:

We are a private carrier operating 89 Van Trailers, 5 Low-Boys, 3 Tankers, 1 Bus and 49 Tractors. These units carry a gross of 40-44,000 lbs. on single axle units and 54-59,000 lbs. on the tandems, both in local and over-the-road operations.

With the exception of 3 Trailers and 4 Tractors, all of our equipment has 10-Hole Budd Wide-Base Disc Wheels, using 10.00 x 20 Tires. The Wheels have double-tapered rims, which give full support under both beads.

We were recently awarded top honors for both safety and shop excellence in the Private Carrier Class at the American Trucking Association Convention in Boston. Our Company supports the policy of keeping our fleet up-to-date as evidenced by the fact that our Trucks and Trailers are equipped with Budd Wide-Base Wheels with double-tapered Rim. We feel that our up-to-date wheel equipment was in part responsible for the award received.

In addition to the wide-base and double-tapered bead seat features which gives us better tire mileage than we ever had before, we like the fact that the wheels are always true and also, if a driver has trouble on a return trip when lightly loaded or empty, he can remove one wheel and come in on a single wheel, which saves layover or breakdown time, plus the cost of service calls.

Another operation at our mill which is separate from our highway transportation is the dump truck operation of hauling raw materials from storage piles out in yard. No pavement and lots of muck and mud, hence lots of bogging down and wheel spinning, yet these units on Budd wheels experience no rim spinning and shearing of valve stems.

Yours truly,

ALTON BOX BOARD CO. TRANS. DEPT.

Walter Klasner

Walter Klasner, Mgr.

Available in both standard and lightweight construction.

GENUINE
Budd
COLD TAPERED DISC
WHEEL

(Reprint letter from Alton Box Board Company)

Today, more than ever, tire problems are important to all truck operators. If you would like to know how Budd advanced wheels can save *you* money, call your distributor at the left.

The Budd Company, Detroit 14

*Pure Oil Co., 35 E. Wacker Dr., Chicago, Ill.
*Quaker State Oil Refining Co., Oil City, Pa.
Richfield Oil Corp. of N. Y., 19 W. 50th St., New York, N. Y.
*Shell Oil Co., 50 W. 50th St., New York 20, N. Y.
*Sinclair Refining Co., 630 Fifth Ave., New York, N. Y.
*Socony Vacuum Oil Co., 26 Broadway, New York 4, N. Y.
Sonneborn & Sons, Inc., L., 88 Lexington Ave., New York, N. Y.
*Standard Oil of Cal., San Francisco, Cal.
*Standard Oil Co. (Ind.), 910 S. Michigan St., Chicago 80, Ill.
Standard Oil Co. of N. J., 26 Broadway, New York 4, N. Y.
Sun Oil Co., Philadelphia, Pa.
*Texas Co., 135 E. 42nd St., New York 17, N. Y.
*Tidewater Associated Oil Co., 17 Battery Pl., New York, N. Y.
*Warren Refining & Chemical Co., Cleveland 15, Ohio
Waverly Petroleum Products Co., Philadelphia, Pa.
Wolfs Head Oil Refining Co., Oil City, Pa.

FUSE PANELS—See Panels, Fuse & Junction Blocks

FUSES

Commercial Enclosed Fuse Co., Hoboken, N. J.
Ero Mfg. Co., 714 Monroe St., Chicago, Ill.
Littlefuse, Inc., 4757 Ravenswood Ave., Chicago 40, Ill.
Pierce Renewable Fuses, Inc., Buffalo 7, N. Y.

GASKETS

Advance Packing & Supply Co., 618 W. Adams St., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Chicago Rawhide Mfg. Co., 1301 N. Elston St., Chicago 22, Ill.
Continental-Diamond Fibre Co., Newark, Del.
Detroit Gasket & Mfg. Co., Detroit, Mich.
Felt Products Mfg. Co., 1307 Carroll Ave., Chicago 7, Ill.
*Fitzgerald Mfg. Co., Torrington, Conn.
*Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Keasby & Mattison Co., Ambler, Pa.
McCord Corp., Detroit, Mich.
Peck Corp., B. G., Lawrence, Mass.
Vellumoid Co., Worcester, Mass.
Victor Mfg. & Gasket Co., 5750 W. Roosevelt Rd., Chicago, Ill.
Wilmington Fibre Specialty Co., Wilmington, Del.

GEARS, DIFFERENTIAL

Carpenter Gear & Engine Co., Pittsburgh, Pa.
*Clark Equipment Co., Buchanan, Mich.
Eaton Mfg. Co., Cleveland 10, Ohio
Foote Bros. Gear & Machine Corp., 5318 S. Western Blvd., Chicago 9, Ill.
Lempco Products, Inc., Bedford, Ohio
Micro Test Gear Co., Indianapolis, Ind.
New Process Gear Co., Syracuse, N. Y.
Perfection Gear Co., Harvey, Ill.
*Spicer Mfg. Corp., Toledo 1, Ohio
Thornton Tandem Co., Detroit, Mich.

GEARS, FLYWHEEL RING

Accurate Gear Div., Republic Gear Co., Detroit, Mich.
Automotive Gear Works, Richmond, Ind.
Lempco Products, Inc., Bedford, Ohio.
Logan Gear Co., Toledo, Ohio
New Process Gear Co., Syracuse, N. Y.

GEARS, STEERING

*Gemmer Mfg. Co., Detroit, Mich.
*Ross Gear & Tool Co., Lafayette, Ind.
Saginaw Steering Gear Div., General Motors Corp., Saginaw, Mich.
Vickers, Inc., Detroit, Mich.

GEARS, TIMING

Accurate Gear Div., Republic Gear Co., Detroit, Mich.
Cloyes Gear Works, Cleveland, Ohio.
Continental-Diamond Fibre Co., Newark, Del.
D & B Mfg. Co., 2335 S. Michigan Ave., Chicago, Ill.
*Electric Auto-Lite Co., Toledo 1, Ohio
General Electric Co., Pittsfield, Mass.
*Hoof Products Co., 6543 S. Laramie Ave., Chicago, Ill.

GEARS, TRANSMISSION

Automotive Gear Works, Richmond, Ind.
Carpenter Gear & Engine Co., Pittsburgh, Pa.
*Clark Equipment Co., Buchanan, Mich.
Covert Gear & Mfg. Co., Lockport, N. Y.
Dittmer Gear & Mfg. Corp., Lockport, N. Y.
Foote Bros. Gear & Machine Corp., 5318 S. Western Blvd., Chicago 9, Ill.
Fuller Mfg. Co., Kalamazoo, Mich.
Lempco Products, Inc., Bedford, Ohio
*Lipe-Rollway Corp., Syracuse, N. Y.
Machanics Universal Joint Div., Borg-Warner Corp., Rockland, Ill.
Muncie Gear Works, Muncie, Ind.
New Process Gear Corp., Syracuse, N. Y.
Perfection Gear Co., Harvey, Ill.
*Spicer Mfg. Corp., Toledo 1, Ohio
Stolp Associates, Geneva, N. Y.
Warner Gear Div., Borg-Warner Corp., Muncie, Ind.

GENERATORS, AUTOMOTIVE

American Bosch Corp., Springfield, Mass.
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
*Electric Auto-Lite Co., Toledo, Ohio
*Leece-Neville Co., Cleveland, Ohio
Owens-Dyneto Div., Electric Auto-Lite Co., Syracuse, N. Y.

GLASS, NON-SHATTERABLE

American Window Glass Co., Pittsburgh, Pa.
*Libbey-Owens-Ford Glass Co., Toledo, Ohio
*Pittsburgh Plate Glass Co., Pittsburgh, Pa.

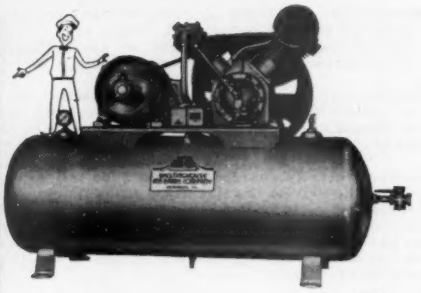
GOVERNORS, ENGINE

*Consolidated Car-Heating Co., Albany, N. Y.
*Hoof Products Co., 6543 S. Laramie Ave., Chicago, Ill.
King Seeley Corp., Ann Arbor, Mich.
Klemm Automotive Prods. Co., 1718 N. Monarch Governor Co., Detroit, Mich.
Pierce Governor Co., Anderson, Ind.

Note—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

NO OIL— NO AIR!

Westinghouse "Y" saves money for you!



With most machines, *no oil* means a repair job. When someone forgets to lubricate, the oil-starved unit runs itself right into the repair shop.

With the Westinghouse "Y" Compressor, it's a different and happier story. The "Y" gives you warning when the oil level is too low; it refuses to pump air. If the level drops during operation, the "Y" unloads. This S.O.S. lets you supply oil before scoring, seizing or other damage occurs.

This exclusive "No Oil—No Air" protection has saved countless repair bills for users . . . and it's only one of a parade of modern features you get in the Westinghouse "Y". Thermal overload protection—Starting Unloader . . . automatic pressure control . . . automotive-type pressure lubrication . . . multiple V-belt drive. Every one helps to give you a more dependable, economical air supply. And that's a big consideration *today*—that no one can afford to overlook!

Only the Westinghouse "Y" gives you ALL THREE

Low Oil Level Protection—No Oil—No Air, bans wear and repair.

Thermal Overload Protection—Standard, at no extra cost, on the "Y".

Starting Unloader—Compressor remains unloaded till speed and oil flow are normal.

Westinghouse "Y" capacities range from 6.2 to 68 cfm displacements . . . motor HP from 1½ to 15. Gas engine drive also available. Horizontal or vertical tanks.

Westinghouse Air Brake Co.

Industrial Products Division—WILMERDING, PA.
Factory Branch: EMERYVILLE, CALIFORNIA

ASK FOR BULLETIN IDC 9302-3. FOR FULL DETAILS

DISTRIBUTORS THROUGHOUT THE UNITED STATES . . . CONSULT YOUR CLASSIFIED DIRECTORY
DISTRIBUTOR IN CANADA: CANADIAN WESTINGHOUSE CO., LTD., HAMILTON, ONTARIO

Protex Glass Co., 220 Fifth Ave., New York, N. Y.
Rohm & Haas Co., Philadelphia 5, Pa.
Safetee Glass Co., Philadelphia, Pa.
Damen Ave., Chicago, Ill.
Speedmaster Corp., Plainville, Conn.
Woodward Governor Co., Rockford, Ill.
*Zenith Carburetor Div., Bendix Aviation Corp., Detroit, Mich.

GRILLS, METAL

Evans Products Co., Detroit 27, Mich.
Gross Engineering Co., Carbondale, Pa.

HARDWARE and FITTINGS, BODY

Ackerman-Blaesser-Fexsey, Detroit, Mich.
*Attwood Brass Works, Grand Rapids 4, Mich.
Auto Vehicle Parts Co., Newport, Ky.
Bassick Mfg. Co., Bridgeport, Conn.
Cleveland, Hardware & Forging Co., Cleveland, Ohio
Cowles & Co., C., New Haven, Conn.
Duro Metal Products Co., 2649 N. Kildare Ave., Chicago, Ill.
Eberhard Mfg. Co., Cleveland 4, Ohio
*Edwards Co., O. M., Syracuse, N. Y.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Ellcon Co., 50 Church St., New York, N. Y.
*Excel Corp., Elkhart, Ind.
Hansen Mfg. Co., A. L., 5037 Ravenswood Ave., Chicago, Ill.
Herron-Zimmers Moulding Co., Detroit 12, Mich.
*Moore & Co., Sam., Mantua, Ohio
*National Lock Washer Co., Newark, N. J.
Tompkins, H. S., 82 Day St., New York, N. Y.
Troy Sunshade Co., Troy, Ohio
Tubecraft, Inc., Cleveland 2, Ohio
Wellman Bronze & Aluminum Co., Cleveland 4, Ohio
Woodruff & Sons Co., Walter W., Mt. Carmel, Conn.

HEATERS, BUS BODY

Anchor Post Products, Inc., Baltimore 24, Md.
Cadillac Co., Inc., Coldwater, Mich.
*Consolidated Car-Heating Co., Albany, N. Y.
Chicago Mfg. Co., 411 N. Trumble St., Chicago, Ill.
E. A. Laboratories, Brooklyn, N. Y.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Evans Products Co., Detroit 27, Mich.
General Elec. Co., Schenectady 5, N. Y.
Hans Industries, Edmund, Detroit 4, Mich.
Hunter & Co., Cleveland 14, Ohio
Liberty Foundries Co., Rockford, Ill.
Lintern, Inc., A. R., Detroit 27, Mich.
Luminator, Inc., 120 N. Peoria St., Chicago, Ill.
Kysor Heater Co., Cadillac, Mich.
McCord Corp., Detroit, Mich.
Murray Mfg. Co., D. J., Wausau, Wis.
Petroleum Heat & Power Co., Stamford, Conn.
Stewart-Warner Corp., South Wind Heater Div., Indianapolis, Ind.
Toledo Heater Co., Toledo 1, Ohio
*Tropic-Aire, Inc., 4501 W. Augusta Blvd., Chicago, Ill.
*Vapor Heating Corp. Railway Exchange Bldg., Chicago, Ill.

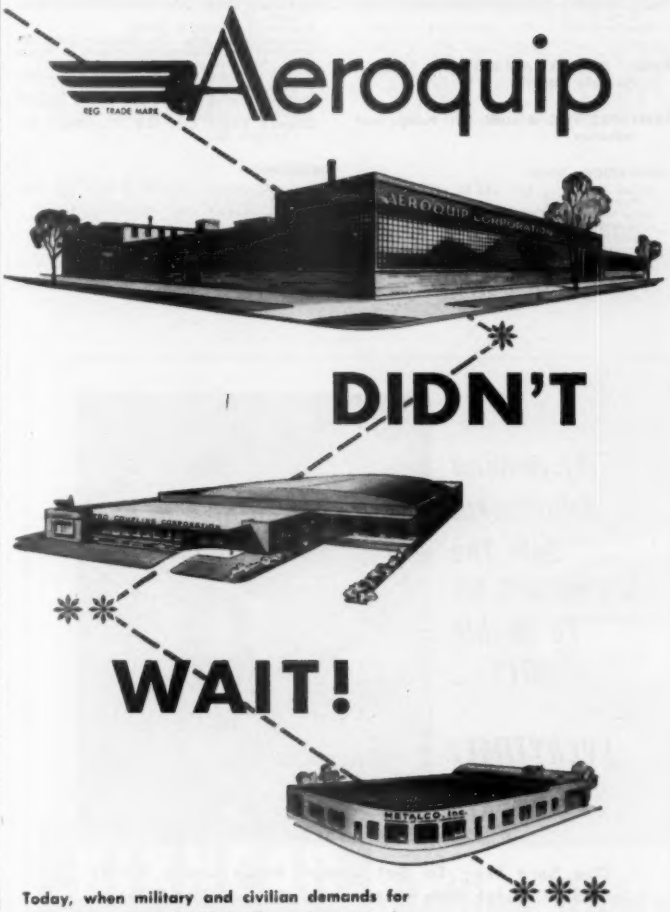
HEATERS, ENGINE

Anchor Post Products, Inc., Baltimore 24, Md.
Bridgeport Thermostat Co., Bridgeport, Conn.
*Consolidated Car-Heating Co., Albany, N. Y.
Hunter & Co., Cleveland, Ohio
Perfection Stove Co., Cleveland, Ohio
Petroleum Heat & Power Co., Stamford, Conn.
*Ross Heater & Mfg. Co., Inc., Buffalo 13, N. Y.
Surface Combustion Corp., Columbus 16, Ohio
Synchro-Start Products, Inc., 1046 W. Fullerton, Chicago, Ill.

HORNS—See Signals, Warning

HOSE, AIR, TIRE INFLATING, RADIATOR and WATER

*American Brake Shoe Co., American Brakeblok Div., Detroit, Mich.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Continental Rubber Works, Erie, Pa.
*Dayton Rubber Mfg. Co., Dayton, Ohio
*Firestone Tire & Rubber Co., Akron, Ohio
*Gates Rubber Co., Denver 17, Colo.
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio
Manhattan Rubber Mfg. Div. Raybestos-Manhattan, Inc., Passaic, N. J.
*Moore & Co., Sam, Mantua, Ohio
*Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn.
*Thermoid Co., Trenton, N. J.



Today, when military and civilian demands for its products have doubled all previous records, Aeroquip announces the *completion* of a sizable expansion program. Two new structures and the acquisition of a new subsidiary have added more than 100,000 sq. ft. of highly productive space to Aeroquip's plant facilities.

It is not through mere chance that these important new additions are in operation *today*. More than a year ago the first warning signs that led to rearmament were recognized. Then, Aeroquip didn't wait for government prodding or financing, but with private capital and typical American initiative began a project which assures greatly increased production of vital Aeroquip products TODAY . . . *when they are of utmost importance.*

******In Jackson, Michigan, there is a new 65,000 sq. ft. addition to the Aeroquip main plant.*

*******In Burbank, California, this modern 30,000 sq. ft. plant has just been completed.*

********Metalco, Inc., a new Aeroquip subsidiary, operates this plant in Cheboygan, Michigan.*

AEROQUIP CORPORATION
JACKSON, MICHIGAN

FLEXIBLE HOSE LINES • DETACHABLE, REUSABLE FITTINGS • SELF-SEALING COUPLINGS • BREAKAWAY COUPLINGS • HYDRAULISCOPE

*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.
Weatherhead & Co., Cleveland 8, Ohio

HOSE, FLEXIBLE METALLIC—See Tubing, Flexible Metallic

INJECTORS, FUEL & LUBE—See Pumps and Injectors

INSULATION, BODY

Alfoil Insulation Co., 155 E. 44th St., New York 17, N. Y.
American Felt Co., Glenville, Conn.
American Hair & Felt Co., Merchandise Mart, Chicago 5A, Ill.
Armstrong Cork Co., Lancaster, Pa.
Burgess Battery Co., 500 W. Huron St., Chicago, Ill.
Celotex Corp., 919 N. Michigan Ave., Chicago 3, Ill.
Dry-Zero Corp., Merchandise Mart, Chicago, Ill.
Felters Co., Boston, Mass.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Insulite Div., Minnesota & Ontario Paper Co., Minneapolis 2, Minn.
Masonite Corp., 111 W. Washington St., Chicago, Ill.
Owens-Corning Fiberglass Corp., Toledo, Ohio
Seaman Paper Co., 220 W. Adams St., Chicago, Ill.

INSURANCE

Joyce & Co., Inc., 105 W. Adams St., Chicago, Ill.
*Markel Service, Inc., Richmond, Va.

JOINTS, UNIVERSAL

Almetal Universal Joint Co., Cleveland, Ohio
Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
Blood Bros. Machine Co., Allegan, Mich.
Mechanics Universal Joint Div., Borg-Warner Corp., Rockford, Ill.
Morse Chain Co. Ithaca, N. Y.
New England Auto Products Corp., Pottstown, Pa.
New Process Gear, Inc., Syracuse, N. Y.
*Spicer Mfg. Corp., Toledo 1, Ohio
Universal Products Co., Dearborn, Mich.

KITS, FIRST AID

Bauer & Black Div., Kendall Co., 2500 S. Dearborn St., Chicago, Ill.
Bullard Co., E. D., San Francisco, Calif.
Burroughs Welcome & Co., 9 E. 41st St., New York 17, N. Y.
Johnson & Johnson, New Brunswick, N. J.
Mine Safety Appliances Co., Pittsburgh, Pa.

LABELS, IDENTIFICATION

Brady Co., W. H., Milwauke 3, Wis.

LACQUER—See Paint, Enamel and Lacquer

LAMPS, FOG and DITCH

American Bosch Corp., Springfield, Mass.
Appleton Electric Co., 1701 W. Wellington Ave., Chicago, Ill.
*Arrow Safety Device Co., Mt. Holly, N. J.
*Dietz Co., R. E., 225 Wilkinson St., Syracuse 1, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago 5, Ill.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Griffin Lamp Co., Hamilton, Ohio
Grote Mfg. Co., Moorestown, N. J.
K-D Lamp Co., Cincinnati, Ohio
Rich Foglite, Inc., Bellaire, Ohio
S & M Lamp Co., Los Angeles 54, Calif.
Teleoptic Co., Racine, Wis.
Unity Mfg. Co., 2909 Indiana Ave., Chicago, Ill.
Yankee Metal Prods. Co., Norwalk, Conn.

LAMPS, HEAD, TAIL and Marker

American Automatic Devices Co., 530 S. Throop St., Chicago, Ill.
*Arrow Safety Device Co., Mt. Holly, N. J.
*Dietz Co., R. E., 225 Wilkinson St., Syracuse, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago 5, Ill.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia, 32, Pa.
Griffin Lamp Co., Hamilton, Ohio
Grote Mfg. Co., Moorestown, N. J.
*Guide Lamp Div., General Motors Corp., Anderson, Ind.
Hall Lamp Co., C. M., Detroit 7, Mich.
K-D Lamp Co., Cincinnati, Ohio
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
S & M Lamp Co., Los Angeles 54, Calif.
Trippe Mfg. Co., 570 W. Adams St., Chicago, Ill.
Yankee Metal Prods. Co., Norwalk, Conn.

LAMPS, INTERIOR—See Fixtures and Fittings, Lamp

LAMPS, MINIATURE INCANDESCENT

Carlton Lamp Corp., Newark, N. J.
General Electric Co., Lamp Dept., Cleveland 12, Ohio
Herzog Miniature Lamp Works, Long Island City, N. Y.
National Carbon Co., 30 E. 42nd St., New York 17, N. Y.
North American Electric Lamp Co., St. Louis 6, Mo.
Sylvania Electric Products Co., 500 Fifth Ave., New York 18, N. Y.
Trippe Mfg. Co., 570 W. Adams St., Chicago, Ill.
Tung-Sol Lamp Works, Inc., Newark 4, N. J.
*Westinghouse Electric Corp., Pittsburgh, Pa.

LEATHER, ARTIFICIAL

*Chicopee Mfg. Co., 47 Worth St., New York, N. Y.
*du Pont de Nemours & Co., E. I., Wilmington, Delaware
Firestone Industrial Products Co., Akron, Ohio
*Goodall Fabrics, Inc., 525 Madison Ave., New York, N. Y.
*Goodrich Co., B. F., Akron 18, Ohio
Hooper & Sons Co., W. E., Philadelphia, Pa.
Pantasote Co., 444 Madison Ave., New York, N. Y.

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

Micrometer Adjustment Sets The S-T MODEL 45 To Within .001" . . EVERYTIME!

One Sure Way To Get Longer Brake Lining Wear; Smooth, Quiet, Safe Stops; and Increased Tire Mileage

The fine-precision accuracy of the S-T Model 45 grinds brake lining to close tolerance, assures uniform, overall contact between lining and brake drum with the result that operators receive thousands of extra miles of brake lining service; tires wear longer and more uniform . . . **a sure way to reduce maintenance costs.**

The S-T Model 45 is simple and easy to operate and assures speed and accuracy on all jobs. It works from either straight or tapered axles or steering spindle, and will accommodate drums from 10" to 21½" in diameter

Brake jobs, regardless how good the lining or how expert the mechanic, are only as good as your brake lining equipment. Remember, for consistently low annual brake costs, use S-T fine-precision brake lining equipment . . . EVERY PIECE THOROUGHLY INSPECTED AND TESTED BEFORE DELIVERY.

See your local jobber for complete information. If he is unable to supply you, clip the coupon below and send to the factory.

Shepard-Thomason Co.
Please send complete information on the Model 45 grinder, together with prices in my area

NAME .....

ADDRESS .....

CITY ..... STATE .....

SHEPARD-THOMASON CO.

2023 West Gage Ave.,

Los Angeles 47, California

*Reeves Bros. Co., 54 Worth St., New York, N. Y.
Susquehanna Mills, Inc., 404 Fourth Ave., New York, N. Y.
Textileather Corp., Toledo 4, Ohio
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.

LEATHER, NATURAL

Astabula Hide & Leather Co., Astabula, Ohio
Blanchard Bros. & Lane, Newark, N. J.
Eagle-Ottawa Leather Co., Grand Haven, Mich.
General Leather Co., Newark, N. J.
Lackawanna Leather Co., Hackettstown, N. J.
Radel Leather Mfg. Co., Newark, N. J.

LINING and BLOCKS, BRAKE

*American Brake Shoe Co., American Brakeblok Div., Detroit, Mich.
Anchor Packing Co., Philadelphia, Pa.
Asbestos Mfg. Co., Huntington, Ind.
Atlas Asbestos Co., North Wales, Pa.
*Bendix Marshall-Eclipse, Troy, N. Y.
Fibre & Metal Products, Inc., Downey, Calif.
*Firestone Tire & Rubber Co., Akron, Ohio
*Gatke Corp., 228 N. LaSalle St., Chicago, Ill.
General Metals Powder Co., Akron, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio
*Grey-Rock Div., Raybestos-Manhattan, Inc., Manheim, Pa.
Grizzly Mfg. Co., Paulding, Ohio
*Inland Mfg. Div., General Motors Corp., Dayton, Ohio
*Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Lasco Brake Product Corp., Oakland, Calif.
Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic, N. J.
Miley Co., L. J., 1060 W. Adams St., Chicago, Ill.
Molded Materials, Inc., Philadelphia, Pa.
*Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn.
Russell Mfg. Co., Middletown, Conn.
Scandinavia Belting Co., Newark, N. J.
Southern Friction Materials Co., Charlotte, N. C.
*Thermoid Co., Trenton, N. J.
*Wagner Electric Corp., St. Louis 14, Mo.
Wellman Co., S. K., Cleveland, Ohio
*World Bestos Corp., New Castle, Ind.

LUBRICATORS—See Pumps and Injectors

MIRRORS, REAR VISION

Acme Specialty Mfg. Co., Toledo, Ohio
*American Automatic Devices Co., 530 S. Throop St., Chicago, Ill.
Ansell Specialty Mfg. Co., Brooklyn, N. Y.
*Arrow Safety Device Co., Mt. Holly, N. J.
*Dietz Co., R. E., 225 Wilkinson St., Syracuse 1, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago 5, Ill.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
K-D Lamp Co., Cincinnati, Ohio
Mero-Flex Co., Wichita, Kan.
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
Sparks-Withington Co., Jackson, Mich.
Trico Products Corp., Buffalo, N. Y.
Yankee Metal Prods. Co., Norwalk, Conn.
Speaker & Co., J. W., Milwaukee, Wis.

MUFFLERS, EXHAUST

A. P. Parts Co., Toledo, Ohio
Buffalo Pressed Steel Co., Youngstown 9, Ohio
Burgess Battery Co., Acoustic Div., 500 W. Huron St., Chicago, Ill.
Maremont Automotive Products, Inc., S. Ashland Ave., at 17th, Chicago, Ill.
Maxim Silencer Co., Hartford, Conn.
McCord Corp., Detroit, Mich.
Powell Muffler Co., Utica, N. Y.
Walker Mfg. Co., Racine, Wis.

OPERATORS, PNEUMATIC DOOR

Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
*Consolidated Car-Heating Co., Albany, N. Y.
Electrol, Inc., Kingston, N. Y.
*Midland Steel Products Co., Detroit, Mich.
*National Pneumatic Co., Graybar Bldg., New York 17, N. Y.

OVERHEAD, TROLLEY BUS

*Earll Co., C. I., York, Pa.
*Ohio Brass Co., Mansfield, Ohio
*Westinghouse Elec. Corp., Pittsburgh 30, Pa.

OPEN WIDE

KINNEAR Rolling Doors

Clear The Entire Opening

You get full use of all doorway space when you equip openings with Kinnear Rolling Doors. They clear the doorway completely—from jamb to jamb and from floor to lintel. Even the floor, wall and ceiling space *around* the doorway remains clear and usable at all times.

The doors rise straight upward, coiling above the lintel. Buses can be parked within inches of the door curtain, both inside and outside the entrance, without blocking door action in any way.

The rugged all-steel construction of Kinnear Rolling Doors assures an extra measure of protection against theft, intrusion, storm damage, and fire. Kinnear Rolling Doors are built any size, with manual, mechanical or motor operation. Trolley bridges that operate automatically with the doors are also available. Write for complete information.

The KINNEAR Manufacturing Co.

3050-70 Fields Avenue, Columbus 16, Ohio — 1742 Yosemite Avenue, San Francisco 24, Calif.

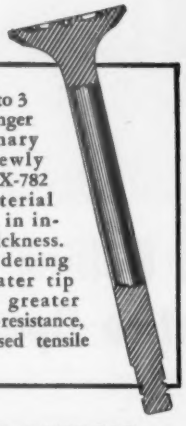
Offices and Agents in All Principal Cities

SAVING WAYS IN DOORWAYS — KINNEAR ROLLING DOORS

Cut Costly Overhaul Time With LONG-LIFE TOLEDO VALVES

Because Toledo Heavy Duty Valves give you 2 to 3 times more service, time out for overhaul is drastically reduced after they are installed. Time on the highway, where your money is made, is thereby proportionately increased, maintenance costs substantially decreased, and engine efficiency is definitely improved.

TOLEDO AEROTYPE VALVES . . .



● Wear 2 to 3 times longer than ordinary valves! Newly developed X-782 facing material is applied in increased thickness. Swage hardening gives greater tip hardness, greater stem wear-resistance, plus increased tensile strength.

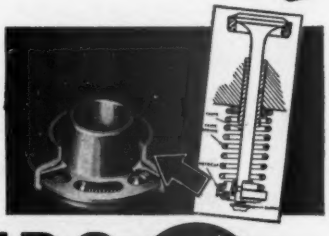
TOLEDO SODIUM-COOLED VALVES

● The ultimate in valves for advanced design engines of today! An aircraft development adapted by Toledo to heavy duty truck and bus use where its unique cooler operating properties increase valve service life.

TOLEDO ROTOCAP

The POSITIVE Type Valve Rotator

With Toledo Rotocaps the valve is constantly rotating at a controlled rate. Hot spots at any point are eliminated. Valve face and seat surfaces are wiped clean. More positive valve guide lubrication lessens wear. Can be used on both overhead and L-head engines.



The **TOLEDO**
STEEL PRODUCTS COMPANY
TOLEDO, OHIO

Since 1906 Makers of The World's Finest Automotive Parts

OXYGEN and GAS, COMPRESSED

Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.
Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y.
Prest-O-Lite Co., 30 E. 42nd St., New York 17, N. Y.
Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

PAINT, ENAMEL and LACQUER

Acme White Lead & Color Works, Detroit, Mich.
American-Marietta Co., East Ohio St., Chicago 11, Ill.
*Arco Co., Cleveland, Ohio
*Ditzler Color Div., Pittsburgh Plate Glass Co., Detroit, Mich.
Dolphin Paint & Varnish Co., Toledo, Ohio
*du Pont de Nemours & Co., E. I., Wilmington, Del.
Egyptian Lacquer Mfg. Co., 1270 Sixth Ave., New York, N. Y.
Fuller & Co., W. P., San Francisco 5, Calif.
Glidden Co., Cleveland 14, Ohio
Interchemical Corp., Newark 1, N. J.
Martin-Senour Co., Chicago 8, Ill.
Midland Paint & Varnish Co., Cleveland 5, Ohio
Monsanto Chem. Co., Merrimac Div., Boston, Mass.
Nason & Co., R. N., San Francisco 3, Calif.
*Paraffine Co., San Francisco, Calif.
Patterson Sargent Co., Cleveland, Ohio
*Pittsburgh Plate Glass Co., Pittsburgh 22, Pa.
Pratt & Lambert, Inc., Buffalo, N. Y.
Rinshed-Mason Co., Detroit 16, Mich.
Sherwin-Williams Co., Cleveland 1, Ohio
Sonneborn Sons, L., 88 Lexington Ave., New York, N. Y.
Valentine & Co., 11 E. 36th St., New York 16, N. Y.
Walker Co., H. V., Elizabeth, N. J.
Zapon Div. Atlas Powder Co., Stamford, Conn.

PANELS and FABRICATIONS, BODY

Alan Wood Steel Co., Conshohocken, Pa.
Algoma Plywood & Veneer Co., Algoma, Wis.
*Aluminum Co. of America, Pittsburgh 19, Pa.
American Hair & Felt Co., Merchandise Mart, Chicago, Ill.
American Rolling Mills Co., Middletown, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Buhelen Lumber & Mfg. Co., Tacoma, Wash.
Carnegie-Illinois Steel Corp., Pittsburgh 30, Pa.
Formica Insulation Co., Cincinnati 32, Ohio
Great Lakes Steel Co., Ecorse, Mich.
Harbor Plywood Corp., Hoquiam, Wash.
Haskelite Mfg. Corp., Grand Rapids 2, Mich.
International Nickel Co., 67 Wall St., New York 5, N. Y.
Kaiser Aluminum & Chemical Sales Corp., Oakland, Calif.
Masonite Co., 111 W. Washington St., Chicago, Ill.
Nicralumin Co., Wilmington, Del.
Noblitt-Sparks Industries, Columbus, Ind.
Republic Steel Corp., Cleveland 1, Ohio
Reynolds Metals Co., Louisville, Ky.
St. Regis Paper Co., 230 Park Ave., New York 17, N. Y.
Snedaker & Co., F. C., Philadelphia 40, Pa.
Superior Sheet Steel Co., Canton, Ohio
U. S. Plywood Corp., 616 W. 46th St., New York 19, N. Y.
U. S. Steel Corp., 71 Broadway, New York, N. Y.
Washington Veneer Co., Olympia, Wash.
Youngstown Sheet & Tube Co., Youngstown, Ohio

PANELS, FUSE & JUNCTION BLOCKS

*Rohden Mfg. Co., 4739 Montrose Ave., Chicago 41, Ill.

PISTONS and PINS

*Aluminum Co. of America, Pittsburgh 19, Pa.
Aluminum Industries, Inc., Cincinnati 25, Ohio
Arrow Head Steel Products Co., Howell, Mich.
Bohn Aluminum & Brass Corp., Holland, Mich.
Burgess-Norton Mfg. Co., Geneva, Ill.
*Deluxe Products Corp., La Porte, Ind.
D.S.C. Industries, Inc., Medina, Ohio
Elgin Machine Works, Elgin, Ill.
Gillett & Eaton, Inc., Lake City, Minn.

Note—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

King Quality Products Co., St. Louis, Mo.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Ohio Piston Corp., Cleveland, Ohio
*Sealed Power Corp., Muskegon, Mich.
Thompson Products, Inc., Cleveland 3, Ohio
*Toledo Steel Products Co., Toledo 1, Ohio
United Engine & Mach. Co., San Leandro, Calif.
Wisconsin Machinery & Mfg. Co., West Allis, Wis.
*Zollner Mach. Works, Fort Wayne, Ind.

PLATES, STEP (Non-Skid)

Alan Wood Steel Co., Conshohocken, Pa.
*American Abrasive Metals Co., Irvington, N. J.
*Attwood Brass Works, Grand Rapids 4, Mich.
Bethlehem Steel Co., Bethlehem, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
*Meliflex Products Co., Akron 8, Ohio
*Moore & Co., Sam, Mantua, Ohio
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
Morton Mfg. Co., 5105 W. Lake St., Chicago 44, Ill.
Turner Brass Works, Sycamore, Ill.
Wooster Products, Inc., Wooster, Ohio

POLISH, BODY and METAL

Cincinnati Varnish Co., Cincinnati, Ohio
Commercial Chem. Co., Charlestown, Mass.
*du Pont de Nemours & Co., E. I., Wilmington, Del.
Franko Super Polish Products, Lyndhurst, N. J.
Hollingshead Corp., R. M., Camden, N. J.
Jewel Paint & Varnish Co., 345 N. Western Ave., Chicago, Ill.
Minnesota Mining & Mfg. Co., St. Paul 6, Minn.
Paul & Co., J. C., 930 Roscoe St., Chicago, Ill.
Park Chemical Co., Detroit, Mich.
Permatex Co., Brooklyn 35, N. Y.
Puritan Co., Rochester, N. Y.
Robertson Products Co., Theo. B., 700 W. Division, Chicago, Ill.
Sherwin-Williams Co., Cleveland 1, Ohio
Simonis Co., 2100 S. Indiana Ave., Chicago 16, Ill.
Sno-Flake Products Co., Detroit, Mich.
Stanley Co., J. T., 642 W. 30th St., New York 16, N. Y.
Wilson Imperial Co., Newark, N. J.
Zinc Corp., Howard, Fremont, Ohio

PUMPS and INJECTORS, FUEL & LUBE

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
Aircraft & Diesel Equipment Corp., 4401 N. Ravenswood Ave., Chicago, Ill.
American Bosch Corp., Springfield, Mass.
*American Diesel Service, 7606 Lorain Ave., Cleveland 2, Ohio
Automotive & Marine Products Co., Boston, Mass.
Autopulse Corp., Ludington, Mich.
Carter Carburetor Corp., St. Louis, Mo.
Emerol Mfg. Co., 242 W. 69th St., New York, N. Y.
Evans Products Co., Detroit 27, Mich.
Ex-Cell-O Corp., Detroit, Mich.
Stewart-Warner Corp., 1328 W. Diversey Parkway, Chicago 14, Ill.

RADIATORS, ENGINE COOLING

Excel Auto Radiator Co., 320 E. 21st Chicago, Ill.
Fedders Mfg. Co., Buffalo, N. Y.
Fleet Sales & Service Co., Mt. Vernon, N. Y.
Flexo Mfg. Co., Los Angeles, Calif.
G & O Mfg. Co., New Haven, Conn.
Harrison Radiator Div., General Motors Corp., Lockport, N. Y.
Lasko Metal Products, West Chester, Pa.
*Long Mfg. Div., Borg-Warner Corp., Detroit, Mich.
McCord Corp., Detroit, Mich.
Modine Mfg. Co., Racine, Wis.
Perfex Corp., Milwaukee, Wis.
Young Radiator Co., Racine, Wis.

RADIO and ACCESSORIES, MOBILE

Belmont Radio Co., 5921 W. Dickens Ave., Chicago 39, Ill.
Bendix Aviation Corp., Pacific Div., Hollywood, Calif.
Communications Co., Coral Gables, Fla.
Farnsworth Television Radio Corp., Fort Wayne 1, Ind.
Federal Telephone & Radio Corp., Clifton, N. J.
General Electric Co., Syracuse, N. Y.
Hallett Mfg. Co., Inglewood, Calif.
Motorola Inc., 4545 W. Augusta Blvd., Chicago, Ill.
Philco Corp., Auto Radio Div., Philadelphia, Pa.
*Radio Corp. of America, Camden, N. J.

TOLEDO MEANS *PROFIT* FOR YOU!

YOUR TOLEDO JOBBER HAS THE INDUSTRY'S BEST JOBBER SERVICE FOR YOU!

1 Complete Line—Genuine Toledo Motor and Chassis Parts (For All Car Models and Makes—For All Trucks, Busses and Tractors)

2 Machine Shop Service

3 Technical Service

Under one roof you get the World's Finest Toledo Motor and Chassis Parts . . . You get complete service on all automotive supplies, equipment, paints . . . You get complete precision machine shop facilities . . . You get technical service to help solve any automotive problem—to your profit. See your Toledo jobber today!

Toledo's complete line includes these outstanding parts: Aerotype and Sodium-Cooled Valves, Rotocaps, Chrom-o-Loy Valve Seats, U-Flex Piston Rings, CL-77 Bearings, Copper-plated Sleeves, Parma Seal Water Pumps, Dual Bearing Tie Rod Ends.

GET IT FROM YOUR JOBBER

The **TOLEDO**
STEEL PRODUCTS COMPANY
TOLEDO, OHIO
Since 1906 Makers of The World's Finest Automotive Parts

TRU-CAR SEATS *are rolling* IN CHICAGO, TOO

On the fleet of 500 Twin Propane Coaches operating on the Chicago Transit Authority Lines, Tru-Car master-built seats are rendering their dependable, long life service for the operator and extending rider satisfaction to millions of this great properties' passengers.

FLASH!

The 1,509 Twin Convertible Coaches for the "Army" are also equipped with Tru-Car specially designed removable folding parlor car seats.

Operators who want to hold their seat maintenance costs to the lowest point possible and give their passengers ease and comfort will do well to remember the name and specify:

★

TRU-CAR

Passenger and Driver Seats, City—Suburban—Intercity

TRU-CAR, INC. • KENT • OHIO

Sylvania Electric Products, Inc., Salem, Mass.
Transit Radio, Cincinnati 14, Ohio
Zenith Radio Corp., 6000 Dickens Ave., Chicago, Ill.

REGISTERS and DEVICES, FARE COLLECTING

Advance Products Co., Detroit, Mich.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Galef & Son, J. L., 35 Chambers St., New York, N. Y.
General Register Co., Long Island City, N. Y.
International Register Co., 2620 Washington Blvd., Chicago, Ill.
*Johnson Fare Box Co., 4619 N. Ravenswood Ave., Chicago, Ill.
Lannon Products Corp., Nashville 3, Tenn.
Main Farebox Co., Willoughby, Ohio
*Money-Meters, Inc., Providence, R. I.
*Ohmer Corp., Dayton 1, Ohio
Oliver Mach. Tool Co., 520 S. Michigan Ave., Chicago 11, Ill.
Perey Turnstile Co., 101 Park Ave., New York 17, N. Y.
Veeder-Root, Inc., Hartford 2, Conn.

RINGS, PISTON

Aluminum Industries, Inc., Cincinnati 25, Ohio
*American Hammered Piston Ring, Div. Koppers Co., Baltimore, Md.
Arrow Head Steel Prod. Co., Howell, Mich.
Burd Piston Ring Co., Rockford, Ill.
*Hastings Mfg. Co., Hastings, Mich.
King Quality Products Co., St. Louis, Mo.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Hoog-St. Louis Piston Ring Co., St. Louis, Mo.
Perfect Circle Co., Hagerstown, Ind.
*Ramsey Accessories Mfg. Corp., St. Louis, Mo.
*Sealed Power Corp., Muskegon, Mich.
Simplex Products Corp., Cleveland, Ohio
Thompson Mfg. Co., Peoria, Ill.
Thompson Products, Inc., Cleveland 2, Ohio
U. S. Hammered Piston Ring Co., Sterling, N. J.
Wausau Motor Parts Co., Wausau, Wis
*Wilkening Mfg. Co., Philadelphia, Pa.

RODS, CONNECTING

*Federal-Mogul Corp., Detroit 13, Mich.
Janibor Tool & Stamping Co., Milwaukee, Wis.
Morris, Inc., J. Leslie, Los Angeles 33, Calif.
Niagara Motors Corp., Dunkirk, N. Y.

SANDERS, HIGHWAY

Elston Corp., St. Paul, Minn.
Flink Co., Streator, Ill.
Good Roads Machinery Corp., Kennett Square, Pa.
*Highway Safety Appliance Co., St. Paul, Minn.
Lintern Corp., Berea, Ohio
Sterling Tool Products Co., 363 E. Ohio St., Chicago, Ill.
Westlake Mfg. Corp., Canastota, N. Y.

SASH, WINDOW

*ACF-Brill Motors Co., Philadelphia, Pa.
*Adams & Westlake Co., Elkhart, Ind.
*Edwards Co. O. M., Syracuse, N. Y.
Excel Corp., Elkhart, Ind.
*National Lock Washer Co., Newark, N. J.
*Transportation Sash Co., Topton, Pa.
Visionator, Inc., Chicago 80, Ill.
Young Windows, Inc., Philadelphia 40, Pa.

SEALS and RINGS, OIL

Chicago Rawhide Mfg. Co., 1281 Elston Ave., Chicago, Ill.
Felt Products Mfg. Co., 1508 Carroll Ave., Chicago 7, Ill.
*Fitzgerald Mfg. Co., Torrington, Conn.
National Motor Bearing Co., Redwood City, Calif.

SEATS

*ACF-Brill Motors Co., Philadelphia, Pa.
*American Seating Co., Grand Rapids, Mich.
Amesbury Seat Mfg. Co., Ypsilanti, Mich.
Buhl Mfg. Co., Detroit 10, Mich.
Eckland Bros. Co., Minneapolis, Minn.
Hardman Mfg. Co., South Gate, Calif.
*Heywood-Wakefield Co., Gardner, Mass.
*Ionia Mfg. Co., Ionia, Mich.
*Karpen & Bros., S., 624 South Michigan Ave., Chicago, Ill.
McArthur Corp., Warren, 1 Park Ave., New York 16, N. Y.
*National Seating Co., Mansfield, Ohio

Note—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

Troy Sunshade Co., Troy, Ohio
*Tru-Car, Inc., Kent, Ohio

SEATS, SPRING or RUBBER CUSHIONS for

Armour Curled Hair Work., Div. Armour & Co., 1355 W. 31st St., Chicago, Ill.
Atkinson Spring Co., F. R., Hamburg, N. Y.
Blacksom & Co., Michigan City, Ind.
Burkhart Mfg. Co., F., St. Louis, Mo.
Dunlop Tire & Rubber Corp., Buffalo, N. Y.
*Firestone Industrial Products Co., Akron, Ohio
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio
Hewitt Rubber Corp., Buffalo, N. Y.
McInerney Spring & Wire Co., Grand Rapids, Mich.
Nukraft Mfg. Co., Shelbyville, Ind.
Owen Silent Spring Co., Bridgeport, Conn.
Royersford Spring Co., Royersford, Pa.
Sponge Rubber Products Co., Derby, Conn.
*Tropic Aire, Inc., 4501 W. Augusta Blvd., Chicago, Ill.
U. S. Rubber Co., Mishawaka, Ind.
Woll & Co., F. P., Philadelphia, Pa.

SEATS, VALVE (Replacement)

*Albertson & Co., Sioux City, Iowa
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Lee Co., K. O., Aberdeen, S. D.
Peterson Welding Laboratories, Kansas City 6, Mo.
Thompson Products, Inc., Cleveland 3, Ohio

SHAFTS, AXLE and PROPELLER

Automotive Gear Works, Richmond, Ind.
Brandt-Warner Mfg. Co., York, Pa.
Champ-Items, Inc., St. Louis, Mo.
Eaton Products, Inc., Cleveland, Ohio
Foote Axle & Forge Co., Los Angeles 33, Calif.
Foreman Mfg. Co., 5353 S. State St., Chicago 9, Ill.
Lempco Products, Inc., Bedford, Ohio
Micro Test Gear Co., Indianapolis, Ind.
Morse Chain Co., Ithaca, N. Y.
Standard Forge & Axle Co., Montgomery, Ala.
*Timken-Detroit Axle Co., Detroit, Mich.
U. S. Axle Co., Pottstown, Pa.

SHIMS, LAMINATED

Laminated Shim Co., Glenbrook, Conn.
National Motor Bearing Co., Redwood City, Calif.

SHOCK-ABSORBERS

*Delco Products Div., General Motors Corp., Dayton, Ohio
*Gabriel Co., Cleveland, Ohio
Houde Engineering Div., Houdaille-Hersey Corp., Buffalo, N. Y.
Monroe Auto Eqpt. Co., Monroe, Mich.
*National Pneumatic Co., Graybar Bldg., New York 17, N. Y.

SHUTTERS, RADIATOR

Brewer-Titchener Corp., Cortland, N. Y.
Cadillac Co., Coldwater, Mich.
Kysor Heater Co., Cadillac, Mich.

SIGNALS, DIRECTIONAL and STOP

American Automatic Devices Co., 530 S. Throop St., Chicago, Ill.
American Bosch Corp., Springfield, Mass.
*Arrow Safety Device Co., Mt. Holly, N. J.
Carpenter Mfg. Co., E. W., Bridgeport 1, Conn.
Carolina Metal Products, Inc., Charlotte, N. C.
*Dietz Co., R. E., 225 Wilkinson St., Syracuse, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago, Ill.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Griffin Lamp Co., Hamilton, Ohio.
*Guide Lamp Div., General Motors Corp., Anderson, Ind.
K-D Lamp Co., Cincinnati, Ohio
Protectal Motor Signal Co., Syracuse, N. Y.
Safety Turn Signal, 4659 N. Clark St., Chicago, Ill.
Signal-Stat Corp., Brooklyn, N. Y.
Taylor Eng. Co., E. C., Tuckahoe, N. Y.
Teleoptic Corp., Racine, Wis.
Yankee Metal Products Corp., Norwalk, Conn.

SIGNALS, FILL

*Scully Signal Co., Cambridge 41, Mass.

SIGNALS, PASSENGER STOP

*Consolidated Car Heating Co., Albany, N. Y.
*Delco-Remy Div. General Motors Corp., Anderson, Ind.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Faraday Electric Corp., Adrian, Mich.
Graybar Electric Co., 420 Lexington Ave., New York 17, N. Y. (Jobbers)
Jessall Plastic, Inc., Hartford, Conn.

SIGNALS, WARNING (Horns, Air and Electric Types)

American Bosch Corp., Springfield, Mass.
*Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Grover Products Co., Los Angeles 15, Calif.
Monroe Standard, Inc., Galion, Ohio
Sparks-Withington Co., Jackson, Mich.

SIGNS, DESTINATION

*Electric Service Mfg. Co., Philadelphia 32, Pa.
Hunter Illuminated Car Sign Co., Flushing, N. Y.
*Railway Utility Co., 2241 Indiana Ave., Chicago, Ill.

SOAP

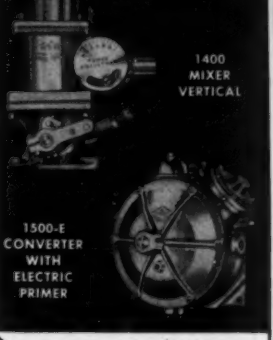
Colgate-Palmolive-Peet Co., Jersey City, N. J.
Cudahy Packing Co., 221 N. La Salle St., Chicago, Ill.
Drew & Co., E. F., 15 E. 26th St., New York, N. Y.
Hollingshead Corp., R. M., Camden, N. J.
Kelite Products, Inc., Los Angeles 1, Calif.
Miller Mfg. Co., Camden, N. J.
Procter & Gamble Co., Cincinnati, Ohio
Puritan Co., Rochester, N. Y.
Robertson Products Co., Thos. B., 700 W. Division St., Chicago, Ill.

Here's Your Answer...

Algas Installation on Hertz Driveurself Truck Stations.

BUTANE ALGAS PROPANE
NATURAL GAS

BUTANE-PROPANE
Carburetion Conversion Equipment



To More Mileage and Lower Maintenance Costs!

Every day more fleet owners are converting to Butane-Propane fuel because test after test have given the same answer - *More Mileage and Lower Maintenance Costs!* A big percentage of these conversions are being made with ALGAS equipment because more than 18 years of successful performance is the record behind every piece of ALGAS equipment.

It makes no difference what your carburetion conversion needs may be, ALGAS equipment will meet all your requirements.

AMERICAN LIQUID GAS CORPORATION
1109 Santa Fe Avenue
Los Angeles 21, California

MAIL THIS COUPON NOW

American Liquid Gas Corp.
1109 Santa Fe Ave., Los Angeles 21

Please send complete information on ALGAS equipment for bus or truck operation.

Name_____
Firm_____
Address_____
City_____ State_____

REDUCE MAINTENANCE COSTS

Use Moto-Gard to reduce Maintenance Costs and insure Longer Life for Your Motors. Moto-Gard will protect your Motor against Damage from an Oil Failure or Overheating. It automatically stops the Motor Ahead of Any Damage if the Oil Pressure runs too low or the Motor gets too hot. MOTO-GARD will make your Equipment Safer and More Profitable.

REASONABLY PRICED . . . EASILY INSTALLED

Full Information on Request

"Don't Buy Motors—Buy Moto-Gard"

THE MOTO-GARD COMPANY

Box 2425

Raleigh, North Carolina

Save this situation with

BUELL AIR HORNS

You have the right of way, but does the *other* driver know it? He does if you signal with Buell Air Horns. Buells have the necessary power to reach out and "Save the Situation." That's why Buells are specified by Greyhound and most other leading bus operators.

Write for literature and prices.

buell manufacturing company

929 W. 49TH PLACE, CHICAGO 9, ILLINOIS

CLEANER BUSSES

AT LOWER COST

We can guarantee you lower maintenance costs, because we offer a sturdily constructed, labor saving brush at an unbelievably low price.

BUSWASH with its aluminum head, rubber protective bumper, 5' seamless steel tubing handle is yours with horsehair bristles for only $8.25. Order No. 650H. Model No. 650BM with nylon mixture for only $13.65.

$8.25

$16.35

FLEETWASH with nylon mixture, flares to full 12", aluminum head, rubber bumper, replaceable head and 5' steel handle, only $16.35. Order by No. 166.

FLO-PAC

Rush your order today to Department 513. Hundreds of other brushes available — send us your requirements.

FLOUR CITY BRUSH CO.
1501 4th Ave., So.
Minneapolis 4, Minn.

PACIFIC COAST BRUSH CO.
1507 Santa Fe Ave.
Los Angeles 21, Calif.

Safety & Maintenance Co., 1 Wall St., New York, N. Y.
Stanley Co., John T., 624 West 30th St., New York 16, N. Y.
Turco Products, Inc., Los Angeles 1, Calif.

SOLDER

Allen & Co., L. B., 6727 W. Bryn Mawr Ave., Chicago, Ill.
Crown Aluminum Solder Co., 883 E. 134th St., New York, N. Y.
Gardiner Metal Co., 4643 S. Campbell Ave., Chicago 32, Ill.
*Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill.
Lenk Mfg. Co., Newton Lower Falls, Mass.
Rocket Distributors, Inc., Bayside, L. I., N. Y.

SOLUTIONS, PARTS CLEANING

Curran Corp., Malden, Mass.
Detrex Corp., Detroit, Mich.
Ford Co., J. B., Wyandotte, Mich.
Fre-eze Products Co., Atlanta 3, Ga.
Gerlach Co., E. A., Philadelphia 40, Pa.
Kelite Products, Inc., Los Angeles 1, Calif.
Lavo Co. of America, Milwaukee, Wis.
MacDermid, Inc., Waterbury, Conn.
*Magnus Chemical Co., Garwood, N. J.
Magnuson Prod. Corp., Brooklyn, N. Y.
*Oakite Products, Inc., 22 Thames St., New York 6, N. Y.
Pennsylvania Refining Co., Cleveland 4, Ohio
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Rust Master Chem. Co., Boston, Mass.
Safety & Maintenance Co., 1 Wall St., New York, N. Y.
Solventol Chem. Products, Inc., Detroit Mich.
Stanley Co., J. T., 642 W. 30th St., New York 16, N. Y.
Turco Products, Inc., Los Angeles 1, Calif.
Wyandotte Chemicals Corp., Wyandotte, Mich.

SPARK PLUGS

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
American Bosch Corp., Springfield, Mass.
Auburn Spark Plug Co., Auburn, N. Y.
*B. G. Corp., 136 W. 52nd St., New York, N. Y.
Blue Crown Spark Plug Co., 1300 W. Winnemac, Chicago, Ill.
*Bowers Battery & Spark Plug Co., Reading, Pa.
*Champion Spark Plug Co., Toledo, Ohio
Edison-Splitdorf Corp., West Orange, N. J.
*Electric Auto-Lite Co., Toledo, Ohio
*Firestone Tire & Rubber Co., Akron, Ohio
Globe-Union, Inc., Milwaukee, Wis.

SPEEDOMETERS, ODOMETERS and TACHOMETERS

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
*Bendix Pioneer Instrument Co., Bendix, N. J.
Corbin Screw Corp., New Britain, Conn.
Cramer & Co., R. W., Centerbrook, Conn.
*Electric Auto-Lite Co., Toledo, Ohio
General Electric Co., Schenectady 5, N. Y.
Jones-Motrola, Stamford, Conn.
Stewart-Warner Corp., 1826 W. Diversey Pkwy., Chicago 14, Ill.
Veeder-Root, Inc., Hartford 2, Conn.
*Wagner Electric Corp., St. Louis 14, Mo.
Weston Electrical Instrument Co., Newark 5, N. J.

SPRINGS, BUS

Atkinson Spring Co., F. R., Hamburg, N. Y.
Eaton Products, Inc., Cleveland, Ohio
Harvey Spring & Forging Co., Racine, Wis.
Iron City Spring Co., Pittsburgh, Pa.
Laher Spring & Tire Corp., Oakland, Calif.
Maremont Automotive Products, Inc., S. Ashland St., at 17th, Chicago, Ill.
Mather Spring Co., Toledo, Ohio
Merrill Spring Co., 530 W. 28th St., New York 1, N. Y.
Rowland, Inc., W. & H., Philadelphia, Pa.
St. Louis Spring Co., St. Louis, Mo.
Service Spring Co., Indianapolis, Ind.
Standard Steel Spring Co., Corapolis, Pa.
Trainor National Spring Co., New Castle, Ind.

Note—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

Tuthill Spring Co., 760 W. Polk St., Chicago, Ill.
U. S. Spring & Bumper Co., Los Angeles 11, Calif.

STAMPINGS—See Panels

TANKS, AUXILIARY OIL

Walden, Inc., S. L., Philadelphia, Pa.

TAPE, MASKING

*De Vilbiss Co., Toledo, Ohio
Eastman Kodak Co., Rochester, N. Y.
*Industrial Tape Corp., New Brunswick, N. J.
Minnesota Mining & Mfg. Co., St. Paul 6, Minn.
Seamless Rubber Co., New Haven, Conn.
Technical Tape Corp., New York 53, N. Y.
*Topflight Tape Co., York, Pa.

THERMOSTATS and CONTROLS

Bishop & Babcock Mfg. Co., Cleveland 14, Ohio
Bridgeport Thermostat Co., Bridgeport, Conn.
Dole Valve Co., 1901 Carroll Ave., Chicago, Ill.
Evans Products Co., Detroit 27, Mich.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Harrison Radiator Div., General Motors Corp., Lockport, N. Y.
*Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.
*Moto-Gard Co., Raleigh, N. C.
Mu Switch Corp., Canton, Mass.
Spencer Thermostat Co., Attleboro, Mass.
*Vapor Heating Corp., 80 E. Jackson Blvd., Chicago 4, Ill.

TICKETS and TOKENS

*General Ticket Co., Nashville, Tenn.
*Meyer & Wenthe, Inc., 30 South Jefferson St., Chicago 6, Ill.
Rand McNally & Co., 536 S. Clark St., Chicago, Ill.
Waterbury Cos., Inc., Waterbury, Conn.

TIRES and TUBES

Armstrong Rubber Co., West Haven, Conn.
Cooper Tire & Rubber Corp., Finlay, Ohio
*Dayton Rubber Mfg. Co., Dayton, Ohio
*Firestone Tire & Rubber Co., Akron, Ohio
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio
*Goodyear Tire & Rubber Co., Akron, Ohio
*Goodrich Co., B. F., Akron, Ohio
Kelly-Springfield Tire Co., Cumberland, Md.
Lee Tire & Rubber Co., Conshohocken, Pa.
Mansfield Tire & Rubber Co., Mansfield, Ohio
Mohawk Rubber Co., Akron, Ohio
Pennsylvania Rubber Co., Mansfield, Ohio
Polson Rubber Co., Garrettsville, Ohio
Seiberling Rubber Co., Barberton, Ohio
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.

TRANSMISSIONS—See Gears, Transmission

TUBING, FLEXIBLE METALLIC

*Aeroquip Corp., Jackson, Mich.
American Metal Hose Branch, American Brass Co., Waterbury, Conn.
*Bendix-Eclipse, Teterboro, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Metal Hose Corp., 1315 S. Third Ave., Maywood, Ill.
Flex-O-Tube Co., Detroit 16, Mich.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia 42, Pa.
Resistoflex Corp., Belleville, N. J.
Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
*Titeflex, Inc., Newark, N. J.

TUBING, OIL and GASOLINE LINE and HYDRAULIC

*Aeroquip Corp., Jackson, Mich.
Aircraft Fittings Co., Cleveland, Ohio
American Brass Co., Waterbury, Conn.
American Tube Bending Co., New Haven, Conn.
*Bendix-Eclipse, Teterboro, N. J.
Chase Brass & Copper Co., Waterburg 91, Conn.
Ilsco Copper Tube & Products Co., Cincinnati 27, Ohio
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.
Parker Appliance Co., Cleveland, Ohio
Penn. Brass & Copper Co., Erie, Pa.
Resistoflex Corp., Belleville, N. J.
*Titeflex, Inc., Newark, N. J.
Weatherhead Co., Cleveland, Ohio

UNIFORMS, CAPS and BADGES

Highway Outfitting Co., 3 E. 28th St., New York 16, N. Y.
*Hook-Fast Specialties, Providence, R. I.
Lee Sales Co., 35 W. 32nd St., New York, N. Y.
*Maier-Lavaty Co., 2143 N. Lincoln Ave., Chicago, Ill.
*Reeves Bros., Inc., 54 Worth St., New York, N. Y.
Russell Uniform Co., 1600 Broadway, New York, N. Y.
Wentworth-Forman Co., Boston, Mass.

UNIVERSALS—See Joints, Universal

UPHOLSTERY—See Fabrics—also Leather

VALVES, ENGINE

Aluminum Industries, Inc., Cincinnati 25, Ohio
Automotive Products Corp., Cincinnati 25, Ohio
King Quality Products Co., St. Louis, Mo.
McQuay-Norris Mfg. Co., St. Louis, Mo.
*Sealed Power Corp., Muskegon, Mich.
Thompson Products, Inc., Cleveland 3, Ohio
*Toledo Steel Products Co., Toledo 1, Ohio
Wilcox-Rich Div., Eaton Mfg. Co., Detroit, Mich.

VALVES, TIRE

Dill Mfg. Co., Cleveland 8, Ohio
Jenkins Bros., Inc., Bridgeport, Conn.
Lacey Webber, Kalamazoo, Mich.
*Schraeder's Son, A., Div. Scovill Mfg. Co., Brooklyn, N. Y.

VENTILATORS

Cadillac Co., Coldwater, Mich.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Evans Products Co., Detroit 27, Mich.
Garland Ventilator Co., 1511 E. Hyde Park, Chicago, Ill.
Lintern, Inc., A. R., Detroit 27, Mich.

Shop Superintendent Saves 3 ways with...

New Stewart-Warner

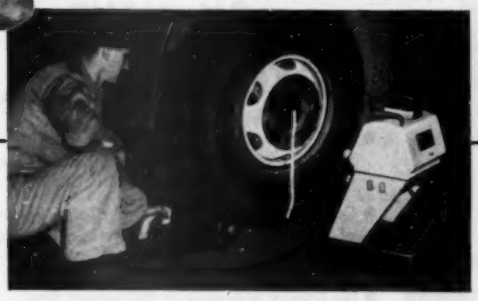
Electronic

Wheel Balancer!

Here's what Mr. L. C. Osburn, Shop Superintendent of Continental Southern Trailways* says:

"We're counting *new* savings three ways, since getting one of your *Electronic* Wheel Balancers. We're saving our drivers from the danger and risks of "shimmy" and road shock. Saving valuable time in the maintenance of steering systems. Saving money, too, through increased tire mileage."

*Shreveport, Louisiana



H. S. PASCHELL checks the left front on one of Continental's fleet of 142 buses.

In minutes, this new *Electronic* Wheel Balancer checks single or dual, front or rear wheels—*in true, running position!* You avoid costly repairs, replacements and "downtime" *in advance!* And you increase greatly tire mileage—so important in the light of current restrictions, shortages.

Vibrations and pounding on front-end assemblies, tie rods and bushings are eliminated—without removing the wheels from the vehicle. Degree of unbalance is quickly, accurately registered up to 2/1000 of an inch by this easy, Electronic method.

Write today for complete *free* information on this easy-to-use unit, produced by Stewart-Warner only. Address Dept. E-61 for rapid reply.

Stewart-Warner Corporation

Dept. E-61, 1826 Diversey Parkway, Chicago 14, Illinois

Here's the ANTIDOTE for This POISON in Your Engine Oils...

No matter what kind or grade of lube oil you use for your truck or bus engines, condensed water in the crank case will cause sludge formation. On "stop-and-go" routes or with "lead foot" or "lugging" drivers this condition is all the surer to give you sludge troubles.

MAGNUS METAFFIN

is a sure antidote. When added to the oil in proper proportion, it keeps condensed water finely dispersed throughout the body of the oil, in such a condition that it is steadily and dependably evaporated through the breather pipes.

Thousands of truck and bus fleets use Metaffin to supplement detergent oils, and again that added protection for "sludge-prone" operating conditions that Metaffin alone can give. And it's a must for ordinary lube oils, of course.

Write for Bulletin 23 to get the Metaffin story in detail.

MAGNUS CHEMICAL CO. • 39 South Ave., Garwood, N. J.
In Canada — Magnus Chemicals, Ltd., Montreal.
Service representatives in principal cities.

Magnus
CLEANERS • EQUIPMENT • METHODS

Save Dollars on your INJECTOR REBUILDING

- **Send us your used Plungers and Bushings from Series 71 Injectors for Reclamation into Guaranteed Usable *Pre-Tested* Assemblies.**
- **Our low price saves you a very large portion of the cost of a new Plunger and Bushing.**
- **Complete Satisfaction Guaranteed.**
- **No Priority necessary at the present time.**
- **Plunger and Bushing Exchange Price, for Series 71 Diesels, in Quantities . . $5.50 each**

Complete Injector Overhaul on Exchange Basis $12.50

Write Now for Full Details, or Send Your Trial Order!

AMERICAN DIESEL SERVICE

7606 LORAIN AVENUE • *Phone: WOodbine 1-4800* • CLEVELAND 2, OHIO

Kysor Heater Co., Cadillac, Mich.
•Railway Utility Co., 2241 S. Indiana Ave., Chicago, Ill.
Sturtevant Div., Westinghouse Electric Corp., Boston, Mass.

WASTE and WIPING RAGS
Advance Packing & Supply Co., 618 W. Adams St., Chicago, Ill.
Mill Remnants Co., 91 Mercer St., New York, N. Y.
Sanitary Institute of America, 100 W. Monroe St., Chicago, Ill.

WHEELS
•Budd Co., The, Detroit, Mich.
•Clark Equipment Co., Buchanan, Mich.
Dayton Steel Foundry Co., Dayton, Ohio
Kelsey-Hayes Wheel Co., Detroit, Mich.
•Motor Wheel Corp., Lansing, Mich.
Permold Co., Medina, Ohio

WINDOWS—See Sash, Window

WIPERS, WINDSHIELD
Air Associates, Inc., Bendix, N. J.
American Bosch Corp., Springfield, Mass.
Anderson Co., Gary, Ind.
•Electric Auto-Lite Co., Toledo, Ohio
Hays Corp., Michigan City, Ind.
Marquette Metal Products Co., Cleveland 10, Ohio
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
•National Pneumatic Co., Graybar Bldg., New York 17, N. Y.
•Sprague Devices, C. A., Michigan City, Ind.
Trico Products Corp., Buffalo, N. Y.

SHOP EQUIPMENT

ANALYZERS, EXHAUST GAS
Allen Elec. & Equip. Co., Kalamazoo, Mich.
•Bennett-Feragen, South Bend, Ind.
•Breeze Corps, Newark, N. J.
•Cambridge Instrument Co., Grand Central Terminal, New York, N. Y.
Electric Heat Control Co., Cleveland 5, Ohio
Engelhard, Inc., Chas., Newark, N. J.
Gow-Mac Instrument Co., Newark, N. J.
Moto Meter Gauge & Equipment Div.,
•Electric Auto-Lite Co., Chrysler Bldg., New York 17, N. Y.
Precision Industries, Inc., Seattle, Wash.
Weidenhoff, Inc., Jos., 4352 W. Roosevelt Rd., Chicago, Ill.

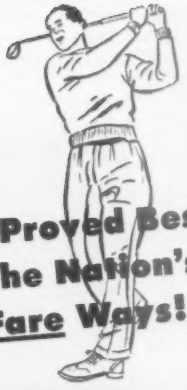
BLOWERS, VENTILATING—See Fans and Blowers

BRUSHES, ROTARY WIRE
•Albertson & Co., Sioux City, Iowa
Osborn Mfg. Co., Cleveland, Ohio
Stow Mfg. Co., Binghamton, N. Y.
U. S. Electrical Tool Co., Cincinnati, Ohio
•Van Norman Co., Springfield, Mass.

BRUSHES, WASHING
Beaurline Fountain Brush Co., 1243 S. Wabash Ave., Chicago, Ill.
•Electric Service Mfg. Co., Philadelphia 32, Pa.
•Flour City Brush Co., Minneapolis, Minn.
Fuller Brush Co., Hartford, Conn.
•Kansas City Brush Co., Kansas City, Mo.
Laitner Brush Co., Detroit 26, Mich.
Milwaukee Dustless Brush Co., Milwaukee, Wis.
Osborn Mfg. Co., Cleveland, Ohio
Pacific Coast Brush Co., Los Angeles 21, Calif.
Rapids Products Co., Cedar Rapids, Iowa
Thomas Fountain Brush Co., Nashville 6, Tenn.
Wilson Imperial Co., Newark, N. J.
Wolfe Brush Co., Pittsburgh, Pa.

CHARGERS, BATTERY
Allen Elec. & Equip. Co., Kalamazoo, Mich.
Baldor Electric Co., St. Louis 10, Mo.
Bean Mfg. Co., John, Lansing, Mich.
Benwood-Linze Co., St. Louis, Mo.
Electric Heat Control Co., Cleveland 5, Ohio
Electronic Laboratories, Inc., Indianapolis 4, Ind.
General Electric Co., Bridgeport, Conn.
Lanagan & Hoke, Philadelphia, Pa.
Lee Co., K. O., Aberdeen, S. D.
Marquette Mfg. Co., Minneapolis 14, Minn.
Mercury Corp., Kansas City, Mo.

NOTE—•More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.



Proved Best on the Nation's Fare Ways!

Let M & W Allocated METAL FARE TOKENS Step Up Your Revenue!

Here's why operators everywhere are standardizing on M & W Allocated Metal Fare Tokens for multi-coin and fractional fare systems:

These distinctive tokens attract riders through the convenience of multi-fare purchases. They speed handling of fares by eliminating change-making. They protect against common methods of duplication. They assure accurate sorting, counting and wrapping because they are identical in size. And they can be used over and over, making them an investment, not an expense.

Write for details and quotation.

***ALLOCATED**—an exclusive M & W method of manufacturing metal fare tokens individually designed for each customer. The perforations and the lettering are in the same relative aligned position on each and every token which makes them identical, preventing duplication.

Established 1854

Meyer & Wenthe

Incorporated

TRANSPORTATION DIVISION

30 S. Jefferson St., Chicago 6, Ill.

Weidenhoff, Inc., Jos., 4352 W. Roosevelt Rd., Chicago, Ill.
Willard Storage Battery Co., Cleveland 1, Ohio

CLEANERS, VACUUM

*Black & Decker Mfg. Co., Towson, Md.
Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 50, Ill.
Clements Mfg. Co., 6650 S. Narragansett, Chicago 38, Ill.
General Electric Co., Bridgeport, Conn.
Hardie Mfg. Co., Hudson, Mich.
Invincible Vacuum Cleaner Mfg. Co., Dover, Ohio
Rexair, Inc., Detroit, Mich.
Spencer Turbine Co., Hartford 6, Conn.
Sturtevant Div., Westinghouse Elec Corp., Boston 34, Mass.
Von Schraeder Mfg. Co., Racine, Wis.

COMPRESSORS, AIR

*American Chain & Cable Co., Detroit 2, Mich.
Baker-Air Equipment Co., Alameda, Calif.
Bean Mfg. Co., John, Lansing, Mich.
*Binks Mfg. Co., 3124 Carroll Ave., Chicago, Ill.
*Brunner Mfg. Co., Utica 1, N. Y.
Champion Pneumatic Machy. Co., Princeton, Ill.
Chicago Pneumatic Tool Co., 6 East 44th St., New York, N. Y.
Curtis Pneumatic Mchy., Div. Curtis Mfg. Co., St. Louis 20, Mo.
Dayton Air Compressor Co., Dayton, Ohio
*De Vilbiss Co., Toledo 1, Ohio
Hardie Mfg. Co., Hudson, Mich.
Imperial-Cantrell Mfg. Co., Jellico, Tenn.
*Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Kellogg Div. American Brake Shoe & Fdy. Co., Rochester, N. Y.
Quincy Compressor Co., Quincy, Ill.
U. S. Air Compressor Co., Cleveland 5, Ohio
Wayne Pump Co., Ft. Wayne, Ind.
*Weaver Mfg. Co., Springfield, Ill.
Westinghouse Air Brake Co., Wilmerding, Pa.
Worthington Pump & Machy. Corp., Harrison, N. J.

CRANES and CHAIN HOISTS

Canton Div., Hill Acme Co., Cleveland, Ohio
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Electro Lift, Inc., 30 Church St., New York 7, N. Y.
Kent-Moore Organization, Detroit, Mich.
Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y.
Silent Hoist & Crane Co., Brooklyn 20, N. Y.
*Weaver Mfg. Co., Springfield, Ill.
Wright Mfg. Div., American Chain & Cable Co., York, Pa.
Yale & Towne Mfg. Co., Philadelphia 24, Pa.

DOORS, GARAGE and SHOP (Automatic Opening Equipment)

Barber-Coleman Co., Rockford, Ill.
*Kinnear Mfg. Co., Columbus 16, Ohio.
Overhead Door Co., Cortland, N. Y.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Truscon Steel Co., Youngstown 1, Ohio

DRILLS, ELECTRIC

*Albertson & Co., Sioux City, Iowa
*Black & Decker Mfg. Co., Towson, Md.
Cummins Portable Tools, 4740 N. Ravenswood Ave., Chicago 40, Ill.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6, Ill.
*Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Millers Falls Co., Greenfield, Mass.
Skilsaw, Inc., 5031 Elston Ave., Chicago 30, Ill.
Stanley Tools, New Britain, Conn.
U. S. Electrical Tool Co., Cincinnati, Ohio
Van Dorn Elec. Tool Co., Towson, Md.

DYNAMOMETERS, ENGINE TESTING

*Bennett-Feragen, South Bend, Ind.
Chatillon & Sons, John, 85 Cliff St., New York 7, N. Y.
Clayton Mfg. Co., 1363 Ellis Lane, El Monte, Calif.
Taylor Dynamometer Co., Milwaukee, Wis.
Toledo Scale Co., Telegraph Rd., Toledo 12, Ohio

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

FLEXLOC®

SELF-LOCKING NUTS

STAY TIGHT AFTER 171,360,000 VIBRATIONS AT 4000 CYCLES PER MINUTE...

Plain nuts with lock washers loosened after only ONE HOUR of 4000-cycle-per-minute operation on the vibrator of a concrete block machine at the plant of the Bethayres Concrete Block Co., Bethayres, Pa.

When FLEXLOC Self-Locking Nuts were installed, they were *still tight* when the machine was torn down for rebuilding after 6 weeks operation—at 4000 C.P.M., 17 hours a day, 7 days a week!

If you have an application where nuts loosen or back off, try FLEXLOC, the one-piece, all-metal STOP- and LOCK-NUT "that won't work loose."

Send for Bulletin 619-A today.

—SPS—

STANDARD PRESSED STEEL CO.

JENKINTOWN 4, PENNSYLVANIA

FANS and BLOWERS, VENTILATING and Exhaust

Buffalo Forge Co., Buffalo, N. Y.
*De Vilbiss Co., Toledo 1, Ohio
Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41, Ill.
Sturtevant Div., Westinghouse Elec. Corp., Boston 36, Mass.
Wing Mfg. Co., L. J., 154 W. 14th St., New York, N. Y.

FIXTURES, ALIGNING (Piston Pin, Rod)

Automotive Maintenance Mchy Co., 2100 Commonwealth Ave., Chicago, Ill.
Storm Mfg. Co., Minneapolis, Minn.
Sunnen Products Co., St. Louis, Mo.
Taft-Pierce Mfg. Co., Woonsocket, R. I.

FLUSHERS, RADIATOR CLEANING

Hoyt-Beardsley Mfg. Co., Sioux City, Iowa
Trowbridge Auto Radiator Co., Cambridge, N. J.

GAGES, TIRE

Acme Air Appliance Co., Brooklyn, N. Y.
*Brunner Mfg. Co., Utica 1, N. Y.
Dill Mfg. Co., Cleveland 8, Ohio
Druge Bros. Mfg. Co., Oakland, Calif.
*Schrader's Son, A., Div. Scovill Mfg. Co., Brooklyn, N. Y.
Service Equipment Co., South Gate, Calif.
Service Station Eqpt. Co., Muskegon, Mich.
U. S. Gage Co., 14 Wall St., New York 5, N. Y.

GAGES, WHEEL ALIGNING

Bear Mfg. Co., Rock Island, Ill.
*Bee Line Co., Davenport, Iowa
*Bennett Feragen, Inc., South Bend, Ind.
Duby Co., John F., Dorchester, Mass.
Lee Co., K. O., Aberdeen, S. D.
Manbee Equipment Co., 185 N. Wabash, Chicago, Ill.
Manley Mfg. Co., Div. American Chain Co., York, Pa.
Motor Wheel Corp., Lansing, Mich.
*Snap-On Tools Corp., Kenosha, Wis.
Speedmaster Co., Des Plaines, Ill.
Testing Apparatus, Inc., Detroit, Mich.
*Weaver Mfg. Co., Springfield, Ill.

GAGES and MICROMETERS

Ames Co., B. C., Waltham, Mass.
Bachavach Industrial Instrument Co., Pittsburgh 8, Pa.
Brown & Sharpe Mfg. Co., Providence, R. I.
Federal Products Corp., Providence, R. I.
Millers Falls Co., Greenfield, Mass.
Plomb Tool Co., Los Angeles 54, Calif.
Pratt & Whitney, Div. Niles-Bement-Pond Co., Hartford, Conn.
Slocomb Co., J. T., Providence, R. I.
Starrett Co., L. S., Athol, Mass.

GRINDERS, BENCH and PEDESTAL

*Albertson & Co., Sioux City, Iowa
American Hydraulics, Inc., Sheboygan, Wis.
Baldor Electric Co., St. Louis 10, Mo.
*Black & Decker Mfg. Co., Towson, Md.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Cincinnati Electrical Tool Co., Cincinnati, Ohio
Lee Co., K. D., Aberdeen, S. D.
Lempco Products, Inc., Bedford, Ohio
Millers Falls Co., Greenfield, Mass.
Simplicity Mfg. Co., Port Washington, Wis.
Stanley Tools, New Britain, Conn.
Sunnen Products Co., St. Louis, Mo.
U. S. Electrical Tool Co., Cincinnati, Ohio
Van Dorn Elec. Tool Co., Towson, Md.
*Van Norman Co., Springfield 7, Mass.
Weidenhoff, Inc., Joseph, 4352 W. Roosevelt Rd., Chicago, Ill.

GRINDERS, CRANKSHAFT

Heald Machine Co., Worcester, Mass.
Landis Tool Co., Waynesboro, Pr.
Norton Co., Worcester 6, Mass.
*Van Norman Co., Springfield, Mass.
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

GRINDERS and HONES, CYLINDER RECONDITIONING

*Albertson & Co., Sioux City, Iowa
American Engr. Co., Philadelphia, Pa.
Automotive Maintenance Mchy. Co., 2100 Commonwealth Ave., N. Chicago, Ill.
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Hall Mfg. Co., Waterbury, Conn.
Landis Tool Co., Waynesboro, Pa.
Lempco Products, Inc., Bedford, Ohio
Rottler Boring Bar Co., Seattle, Wash.
Simplicity Mfg. Co., Port Washington, Wis.
Storm Mfg. Co., Minneapolis, Minn.
Sunnen Products Co., St. Louis, Mo.
*Van Norman Co., Springfield, Mass.
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

GRINDERS, PISTON

Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Rottler Boring Bar Co., Seattle, Wash.
Storm Mfg. Co., Minneapolis, Minn.
*Van Norman Co., Springfield, Mass.

GRINDERS, VALVE (Refacing and Seating)

*Albertson & Co., Sioux City, Iowa
*Black & Decker Mfg. Co., Towson, Md.
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Evans Reamer & Mach. Co., 4541 N. Ravenswood Ave., Chicago, Ill.
Hall Mfg. Co., Waterbury, Conn.
Kent-Moore Organization, Detroit, Mich.
Landis Tool Co., Waynesboro, Pa.
Lee Co., K. O., Aberdeen, S. D.
Lisle Corp., Clarinda, Iowa.
Simplicity Mfg. Co., Port Washington, Wis.
Sunnen Products Co., St. Louis, Mo.
Van Dorn Electric Tool Co., Towson, Md.
*Van Norman Co., Springfield, Mass.
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

GUNS, PAINT SPRAY—See Sprayers, Paint

GUNS, SAND BLAST

Roesch & Co., C. A., Los Angeles, Calif.

GUNS, TANKS and LUBRICATORS, GREASING

Aro Equipment Corp., Bryan, Ohio
Balcrank, Inc., Cincinnati, Ohio
Brown-Dynalube Co., Charlotte, N. C.
Gray Co., Minneapolis, Minn.
Hollingshead Corp., R. M., Camden, N. J.
Lubrication Machy. Corp. of America, Newark, N. J.
Lincoln Engrg. Co., St. Louis, Mo.
Smith-Johnson Co., Los Angeles 21, Calif.
Stewart-Warner Co., 1822 W. Diversey Pkwy., Chicago 14, Ill.
*Weaver Mfg. Co., Springfield, Ill.

HEATERS, GARAGE UNIT

Grinnell Co., Providence 1, R. I.
Modine Mfg. Co., Racine, Wis.
Sturtevant Div., Westinghouse Elec Corp., Boston 36, Mass.
Unit Heater & Cooler Co., Wausau, Wis.

HOISTS—See Cranes and Hoists—also Lifts

HORSES, ADJUSTABLE STEEL

Bassick Co., Bridgeport, Conn.
Kent-Moore Organization, Detroit, Mich.
Manley Mfg., Div., American Chain Co., York, Pa.
Walker Mfg. Co., Racine, Wis.

INSTRUMENTS, DIESEL NOZZLE TESTING

Aircraft & Diesel Equipment Corp., 4401 N. Ravenswood Ave., Chicago, Ill.
Buda Co., Harvey Ill.
Curtiss & Smith Mfg. Corp., Pottstown, Pa.
Hein-Werner Motor Parts Corp., Waukesha, Wis.

INSTRUMENTS, ELECTRICAL TESTING

Allen Electric & Equip. Co., Kalamazoo, Mich.
*Electric Auto-Lite Co., Auto Wire & Cable Div., Toledo, Ohio
Electric Heat Control Co., Cleveland, Ohio
General Electric Co., Schenectady 5, N. Y.
Ideal Industries, Inc., Sycamore, Ill.
Lanagan & Hoke, Philadelphia, Pa.
Sun Elec. Mfg. Co., Chicago, Ill.
Weidenhoff, Inc., Joseph, 4352 W. Roosevelt Rd., Chicago, Ill.
*Westinghouse Elec. Corp., Pittsburgh, Pa.

JACKS, FLOOR and HAND

Airquiment Co., Burbank, Cal.
Ajax Auto Parts Co., Racine, Wis.
*Blackhawk Mfg. Co., Milwaukee 1, Wis.
Buda Co., Harvey, Ill.
Chatsworth Mfg. Co., Chatsworth, Ga.
Cleveland Pneumatic Tool Co., Cleveland 5, Ohio
Coffing Hoist Co., Danville, Ill.
Curtiss & Smith, Pottstown, Pa.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Hein-Werner Motor Parts Corp., Waukesha, Wis.
Joyce-Cridland Co., Dayton, Ohio
Manley Mfg. Div., American Chain Co., York, Pa.
Menasco Mfg. Co., Burbank, Cal.
National Standard Co., Niles, Mich.
Reliable Jack Div., Dayton Malleable Iron Co., Dayton 1, Ohio
Simmons Mfg. Co., Ashland, Ohio
Templeton, Kenly & Co., 1020 S. Central Ave., Chicago 44, Ill.
Walker Mfg. Co., Racine, Wis.
*Weaver Mfg. Co., Springfield, Ill.

LATHES

Axelson Mfg. Co., Los Angeles 11, Calif.
Barnes Co., W. F. & John, Rockford, Ill.
Brown & Sharpe Mfg. Co., Providence, R. I.
Hendly Machine Co., Torrington, Conn.
LeBlond Machine Tool Co., R. K. Cincinnati, Ohio
Rockford Machine Tool Co., Rockford, Ill.
Sheldon Machine Co., 4229 N. Knox Ave., Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.

LATHES and GRINDERS, BRAKE DRUMS

Barrett Equipment Co., St. Louis, Mo.
Bean Mfg. Co., John, Lansing, Mich.
Chicago River & Machine Co., Bellwood Ill.
Curtiss & Smith Mfg. Corp., Pottstown, Pa.
Lempco Products, Inc., Bedford, Ohio.
South Bend Lathe Wks., South Bend, Ind
*Van Norman Co., Springfield, Mass.
Wadell Engineering Co., Garwood, N. J
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

LIFTS or HOISTS, BUS

Curtis Pneumatic Mchy., Div., Curtis Mfg Co., St. Louis 20, Mo.
*Globe Hoist Co., Philadelphia 18, Pa.
Joyce-Cridland Co., Dayton 3, Ohio
Manley Mfg. Div., American Chain Co., York, Pa.
Rotary Lift Co., Memphis, Tenn.
*Weaver Mfg. Co., Springfield, Mass.
*Whiting Corp., Harvey, Ill.

LOCKERS—See Shelving, Parts, Bins, Etc.

MACHINES, SANDING and POLISHING

*Albertson & Co., Sioux City, Iowa
*Black & Decker Mfg. Co., Towson, Md.
Carborundrum Co., Niagara Falls, N. Y.
Detroit Surfacing Mach. Co., Detroit 4, Mich.
Haskins Co., R. G., 2750 W. Flournoy St., Chicago 12, Ill.
Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill.
Pratt & Whitney, Div. Niles-Bement-Pond Co., Hartford, Conn.
Skilsaw, Inc., 5031 Elston Ave., Chicago 30, Ill.
Strand & Co., N. A., 5001 N. Wolcott, Chicago 40, Ill.
U. S. Electrical Tool Co., Cincinnati, Ohio
Van Dorn Elec. Tool Co., Towson, Md.

MACHINES, WHEEL BALANCING

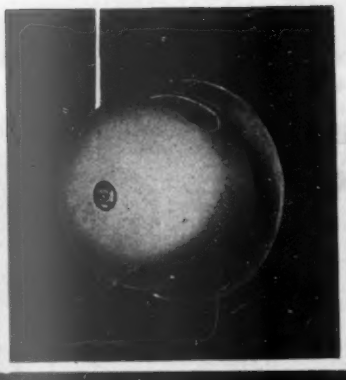
Bean Mfg. Co., John, 1305 S. Cedar St., Lansing, Mich.
Bear Mfg. Co., 21st St. & Fifth Ave., Rock Island, Ill.
*Bee-Line Co., Box 569, Davenport, Iowa
*Bennet-Feragen, South Bend, Ind.
*Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.
*Weaver Mfg. Co., 2177 S. Ninth St., Springfield, Ill.

MICROMETERS—See Gages and Micrometers

PARTS-WASHING, EQUIPMENT for

Blakeslee & Co., G. S., 1844 S. 52nd St., Chicago 50, Ill.
Clayton Mfg. Co., (Kerrick), Alhambra, Calif.
Detrex Corp., Detroit, Mich.
Grinnell Co., Providence 1, R. I.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Gray-Mills Co., Evanston, Ill.
Hydra Lectric Prod. Co., Indianapolis, Ind.
*Magnus Chemical Co., Garwood, N. J.
*Oakite Products, Inc., 22E Thames St., New York 6, N. Y.
Practical Products Co., Minneapolis 8, Minn.
Roth Mfg. Co., 1600 S. Kilbourn Ave., Chicago, Ill.
Siebring Mfg. Co., George, Iowa
Tivit Products Co., Torrance, Calif.
*Whiting Corp., Harvey, Ill.

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.



Earll Trolley Retrievers set the pace for improvements in modern Trolley Bus Equipment. Available with either aluminum or malleable iron shell and bracket.

Earll Retrievers have ALWAYS been noted for long life. Earll Units installed on street cars in 1916—still in service! Earll "8 Units installed on Trolley Buses in 1935—still 100% satisfactory. These "Streamlined Eights" weigh less, act faster, are simpler construction. Write for full information.

C. I. EARLL COMPANY, Inc.

YORK, PA.

FOREIGN AGENTS
INTERNATIONAL GENERAL
ELECTRIC CO.
SCHENECTADY, N. Y.

CANADIAN DISTRIBUTORS
RAILWAY & POWER ENGINEERING
CORPORATION, LTD

earll

TROLLEY RETRIEVERS

TWO SERVICES

that effectively cut your bus armature and maintenance costs . . . . .

★

1. REPAIRS ON BUS ARMATURE SPIRAL STARTER SHAFTS

Here is a service that we just recently added and it is really saving money because repeat business is already coming to us. This repair service on milled grooves of spiral splines gives you a precision job. We weld the worn milled grooves with high grade steel and machine grind them to the exactness of a new shaft. Why purchase new starter bus armatures when Automotive Generator Service can save you the cost and you only pay for a repair job that puts your bus armatures back into active service.

2. RE-MANUFACTURED BUS ARMATURES

Here is a service that has been doing a cost saving job for bus operators from coast to coast. Automotive Generator Service re-manufactures bus armatures so that in many cases, they have performed for twice the ordinary mileage. There's a lot more than re-winding to this service — you get a thorough reconstruction job — complete rebuilding — including shaft, core, windings, commutator, etc.

• *IT'S TRUE ECONOMY*

(ASK ABOUT OUR PRICES)

Today parts are scarce — that's why this service is doubly valuable to you. You keep your present bus armatures in service and you save the difference in costs. Put it up to this specialized service and see how experts can give you excellence in results.

PRECISION WORK . . . PROMPT SERVICE

19 Years Experience

Write for catalog

AUTOMOTIVE GENERATOR SERVICE

4052-54 N. BROADWAY ST. LOUIS 7, MO.

IF IT'S

here...

IT'S news...

IT'S WORTH STOPPING TO SEE!

Maybe Industry doesn't maintain show windows on Fifth Avenue or State Street or Wilshire Boulevard like America's great department stores. But your industry has a mighty effective show window... *and this is it* ... this magazine. In these advertising pages alert manufacturers show their wares. Here you will find up-to-the-minute news about products and services designed to help you do your job better, quicker, and cheaper.
To be well-informed about the latest developments in *your* business, *your* industry... and to stay well-informed... *read all the ads too.*

McGRAW-HILL PUBLICATIONS

These Fare Collectors

SAVE TIME—CUT LOSS

PORTABLE MONEY-METER

Versatile "walking cash register" — fast collection, foolproof count, of up to 3-coin combinations. Tops for peak loading and rear-door operation.

LOCK BOX COLLECTOR

Instant visual audit, portable or stationary.

FARE REGISTER TYPE MR

Flexible and complete, for fast one-man operation.

Send now for folders!

MONEY-METERS, Inc.
17 Warren Street, Dept. 8
Providence 7, Rhode Island

K. C. FOUNTAIN BRUSHES

DO THE JOB EASIER—FASTER

WASHES, RINSES, SCRUBS IN ONE OPERATION—CARS, BUSES, TRUCKS, TRAILERS, TRAMS

All prices quoted are list F. O. B. Kansas City, Mo. If your dealer can't supply you, write direct. Aluminum pipe handles or extensions with hose nut or coupling up to 12 feet 70c per foot.

#101—7" round 4 ft. handle H. D. **$12.50**

#102—8½x4" oblong, 4 ft. handle. H. D. . . **$12.50**

#103—12"x4" oblong, 6 ft. handle **$17.50**

HAND MADE

All Aluminum
• Light Weight
• No Corrosive Parts
• NYLON and Horsetail Mixture Bristles
• Mar-Proof Rubber Bumper
• Replaceable Brush Elements

#104 — 6" round, 4 ft. handle . . . **$6.75**

#108—11¾"x3" oblong 5 ft. handle **$10.95**

#107—10"x3" oblong 4 ft. handle **$9.85**

#105—7½"x3" oblong 4 ft. handle **$6.95**

#106—7" round 4 ft. handle **$9.35**

K. C. FOUNTAIN BRUSH CO. 3718 MAIN ST. KANSAS CITY, MO.

put

BACK ISSUES

to work

Whatever you do with this magazine after you've clipped pertinent articles or advertisements, *please don't destroy it.*

HERE'S WHY:

Churches, Boy Scouts, civic and veterans organizations will welcome all the waste-paper you have. They can get a good price for it. Increase their funds.

And, you can make a direct contribution to American mobilization by saving paper of all types—whether in magazine form or not. Since the Korean War began, there's been a great increase in the demand for products manufactured from wastepaper.

Save it for your favorite organization. Chances are they have scheduled pick-ups.

PRESSES, ARBOR

A. B. C. Products, Los Angeles, Calif.
Greenerd Arbor Press Co., Nashua, N. H.
Lempco Products, Inc., Bedford, Ohio
Manley Mfg. Div., American Chain Co., York, Pa.
*Weaver Mfg. Co., Springfield, Ill.

PULLERS, WHEEL and GEAR

Bear Mfg. Co., Rock Island, Ill.
Cole-Hersee Co., Boston, Mass.
Crane Puller Co., Waltham, Mass.
Curtiss & Smith Mfg. Co., Pottstown, Pa.
Greb Co., Stoughton, Mass.
Manley Mfg. Div., American Chain Co., York, Pa.
Sweeney Mfg. Co., B. K., Denver, Colo.
U. S. Axle Co., Pottstown, Pa.

PUMPS and TANKS, GAS and OIL, STORAGE and DISPENSING

Acme Pump & Tank Corp., 521 Fifth Ave., New York 17, N. Y.
Aqua Systems, Inc., 385 Gerard Ave., New York 51, N. Y.
Bowser, Inc., Fort Wayne, Ind.
Erie Meter Systems, Inc., Erie, Pa.
Gilbert & Barker Mfg. Co., Springfield, Mass.
Liquidometer Corp., Long Island City, N. Y.
Neptune Meter Co., 50 W. 50th St., New York 20, N. Y.
Service Station Equipment Co., Muskegon, Mich.
Sharpsville Steel Fabricators, Inc., Sharpsville, Pa.
Tokheim Oil Tank & Pump Co., Fort Wayne, Ind.
Wayne Pump Co., Fort Wayne, Ind.
Yale & Towne Mfg. Co., Stamford, Conn.

REAMERS—See Taps, Dies, Reamers, Etc.

RECLAIMERS and RECTIFIERS, OIL

Hilliard Corp., Elmira, N. Y.
Luber-Finer, Inc., Los Angeles 7, Calif.
Oil Purifier, Inc., Oakland, Calif.
Skinner Purifiers, Inc., Detroit, Mich.
Youngstown Miller Co., Bellville, N. J.

RECTIFIERS, BATTERY CHARGING — See Charges, Battery

RECTIFIERS, OIL—See Reclaimers and Rectifiers, Oil

REGROOVERS, TIRE

Bendix Products, Div. Bendix Aviation Corp., South Bend, Ind.
Kent-Moore Organization, Detroit, Mich.
Shaler Co., Waupun, Wis.
Stackhouse, E. H., Philadelphia, Pa.
Vanderbilt-Osborne Corp., Newark, N. J.

SANDERS—See Machines, Sanding and Polishing

SHAFTING, FLEXIBLE

Strand & Co., N. A., 5001 N. Wolcott St., Chicago 40, Ill.

SHELVING, PARTS BINS, TOOL STANDS, BENCHES, LOCKERS, ETC.

American Locker Co., Boston, Mass.
Aurora Steel Products Co., Aurora, Ill.
Darby & Son, E. J., Philadelphia, Pa.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Hall Co., Gordon L., Old Lyme, Conn.
Lyon Metal Products, Inc., Aurora, Ill.
National Scale Co., Chicopee Falls, Mass.
Penn Metal Corp., Philadelphia, Pa.
*Standard Pressed Steel Co., Jenkintown, Pa.
Stackbin Corp., Olneyville, R. I.
Superior Mfg. Co., Winston-Salem, N. C.

SPRAYERS, METAL COATING

Metals Coating of America, Philadelphia, Pa.
Metallizing Engineering Co., Long Island City, N. Y.
Metallizing Co. of America, 1330 W. Congress St., Chicago, Ill.

SPRAYERS, PAINT

*Binks Mfg. Co., 3124 W. Carroll Ave., Chicago, Ill.

was this call necessary?

Some "Moral Insurance" here might have avoided a serious accident

Workmen's compensation is a fine thing—but it can't replace a mangled arm.

Safety laws prevent many accidents—but they can't cover every hazard of an individual plant.

Accident prevention which goes *beyond the law* is an unwritten responsibility of every employer. It is his "Moral Insurance" for his employees welfare.

The premiums for "Moral Insurance" are not high. They do not have to be paid for in fancy safety gadgets. Their cost is simply the institution of common sense safety regulations covering all local hazards—enforced by employee committees with the full support of management.

Yes—"plant safety" is a mutual job.

DON'T FORGET—THE LIFE YOU SAVE MAY BE YOUR OWN

A PUBLIC SERVICE PRODUCT THE ADVERTISING COUNCIL

Published in the public interest by:

McGRAW-HILL PUBLICATIONS

Black Mfg. Co., Baltimore, Md.
*Brunner Mfg. Co., Utica 1, N. Y.
Crown Spray Gun Mfg. Co., Los Angeles, Calif.
Curtis Pneumatic Mchy., Div. Curtis Mfg. Co., St. Louis 20, Mo.
Decora Mfg. Co., Berkeley, Calif.
*DeVilbiss Co., Toledo 1, Ohio
Eclipse Air Brush Co., Newark, N. J.
Electric Sprayit Co., Sheboygan, Wis.
Kellogg Div., American Brake Shoe & Fdry. Co., Rochester, N. Y.
Metal Specialties Mfg. Co., 3200 W. Carroll Ave., Chicago, Ill.
Paasche Airbrush Co., 1909 W. Diversey Pkwy., Chicago 14, Ill.
Spray Engineering Co., Somerville, Mass.

STANDS, AXLE REPAIR

Continental Sales Corp., Columbus, Ind.
Curtiss & Smith, Pottstown, Pa.
Kent-Moore Organization ,Detroit, Mich.
Manley Mfg., Div. American Chain Co., York, Pa.
*Weaver Mfg. Co., Springfield, Mass.

STANDS, JIGS and FIXTURES, ENGINE REPAIR

Clayborne Mfg. Co., 4541 W. Lake St., Chicago, Ill.
Continental Mfg. Co., Columbus, Ind.
Curtiss & Smith, Pottstown, Pa.
Kent-Moore Organization, Detroit, Mich.
Latch Enrrg. Co., Chester, Pa.
Manley Mfg., Div. American Chain Co., York, Pa.
*Weaver Mfg. Co., Springfield, Ill.

STANDS, TOOL—See Shelving, Parts Bins

STANDS, TRANSMISSION and DIFFERENTIAL, REPAIR

*Bennett, Feragen, Inc., South Bend, Ind.
Curtiss & Smith, Pottstown, Pa.
Kent-Moore Organization, Detroit, Mich.
Manley Mfg., Div. American Chain Co., York, Pa.

TANKS, GREASING—See Guns and Tanks Greasing

TANKS, OIL and GREASE—See Pumps and Tanks, Oil and Grease

TAPS, DIES, REAMERS, Etc.

Alvord-Polk Tool Co., Millersburg, Pa.

Scientific
FARE COLLECTION
Reduce Front Door Crowding
Obtain Rider Statistics
by installing
PEREY PASSENGER DISTRIBUTOR
AND RIDER METER

PEREY TURNSTILES
Write for information
PEREY TURNSTILE COMPANY
101 Park Ave. New York 17, N. Y.

BUS AGENTS
U.S.A.—CANADA—ALASKA
MEXICO
SCHEDULE INFORMATION
CORRECTED MONTHLY
Russell's Official National
Motor Coach Guide
$8.00 per year, 12 issues—
Published by
RUSSELL'S GUIDES, INC.
Cedar Rapids, Iowa

Automotive Maint. Mach. Co., 2100 Commonwealth Ave., N. Chicago, Ill.
C. & W. Tool Co., Cambridge, Mass.
Cleveland Twist Drill Co., Cleveland, Ohio
Foster-Johnson Reamer Co., Elkhart, Ind.
Greenfield Tap & Die Corp., Greenfield, Mass.
Keystone Reamer & Tool Co., Millersburg, Pa.
Morse Twist Drill & Mach. Co., New Bedford, Mass.
Reiff & Nestor Co., Lykens, Pa.
Ridge Tool Co., Elyria, Ohio
Watervliet Tool Co., Albany, N. Y.
Wayne Tool Co., Waynesboro, Pa

TESTERS, BRAKE

Bean Mfg. Co., John, Lansing, Mich.
Bear Mfg. Co., Rock Island, Ill.
*Bennett-Feragen, Inc., South Bend, Ind.
Muther Mfg. Co., Boston, Mass.
*Weaver Mfg. Co., Springfield, Ill.

TESTERS, DIESEL FUEL NOZZLE

Aircraft & Diesel Equip. Corp., N. Ravenswood Ave., Chicago 40, Ill.
Bacharach Industrial Instrument Co., Pittsburgh 8, Pa.
Buda Co., Harvey, Ill.
Curtiss & Smith Mfg. Corp., Pottstown, Pa.

* This Asterisk . . .

. . . Prefixing the name of any manufacturer listed in the Buyers' Guide indicates more complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues of this year.

TESTERS, EXHAUST GAS—See Analyzers, Exhaust Gas

TOOLS, BEARING

Automotive Maintenance Mchy. Co., 2100 Commonwealth Ave., N. Chicago, Ill.
Freeport Machine Wks., Freeport, Ill.
Kent-Moore Organization, Detroit, Mich.
Landis Tool, Inc., Waynesboro, Pa.
Lempco Products, Inc., Bedford, Ohio
Taft-Pierce Mfg. Co., Woonsocket, R. I.
Tobin-Arp Mfg. Co., Minneapolis 15, Minn.

TOOLS, HAND and SPECIAL PURPOSE

*Albertson & Co., Sioux City, Iowa
*Black & Decker Mfg. Co., Towson, Md.
*Blackhawk Mfg. Co., Milwaukee 1, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Eclipse Air Brush Co., Newark, N. J.
Everhot Mfg. Co., Maywood, Ill.
Fairmount Tool & Forging Co., Cleveland, Ohio
Fostoria Pressed Steel Corp., Fostoria, Ohio
GAC Mfg. Co., Ashland, Ohio
Herbrand Corp., Fremont, Ohio
*Ingersoll Rand Co., 11 Broadway, New York, N. Y.
Ken-Tool Mfg. Co., Akron, Ohio
K-D Mfg. Co., Lancaster, Pa.
Lee Co., K. O., Aberdeen, S. D.
New Britain Mach. Co., New Britain, Conn.
Peck, Stow & Wilcox Co., Southington, Conn.
*Plomb Tool Co., Los Angeles 54, Calif.
Porter, Inc., H. K. Everett 49, Mass.
*Snap-On Tools Corp., Kenosha, Wis.
Stanley Tools, New Britain, Conn.
Swallow Airplane Co., Wichita, Kan.
Van Dorn Electric Tool Co., Towson, Md.
*Weaver Mfg. Co., Springfield, Ill.
*Williams Co., J. H., Buffalo 7, N. Y.

TOOLS, PNEUMATIC

Chicago Pneumatic Tool Co., E. 44th St., New York 17, N. Y.
Cummins Portable Tools, 4740 N. Ravenswood Ave., Chicago 40, Ill.
Independent Pneumatic Tool Co., 260 S. Jefferson St., Chicago 6, Ill.
*Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Keller Tool Co., Grand Haven, Mich.
U. S. Tool Co., Ampere, N. J.

VISES

*American Chain & Cable Co., Bridgeport, Conn.
Columbian Vise & Mfg. Co., Cleveland, Ohio
Millers Falls Co., Greenfield, Mass.
Parker Co., Chas., Meriden, Conn.
Rock Island Div., Birtman Elec Co., Rock Island, Ill.
Stanley Tools, New Britain, Conn.

WASHERS, BUS

*American Chain & Cable Co., Bridgeport, Conn.
Bean Mfg. Co., John, Lansing, Mich.
Beaurline Fountain Brush Co., 1343 S. Wabash Ave., Chicago, Ill.
*Brunner Mfg. Co., Utica 1, N. Y.
Clayton Mfg. Co., Alhambra, Calif.
Curtis Pneumatic Mchy., Div. Curtis Mfg. Co., St. Louis 20, Mo.
Goulds Washing Systems, Inc., 20 N. Wacker Dr., Chicago, Ill.
Hardie Mfg. Co., Hudson, Mich.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jetomatic Corp., Ansonia, Conn.
Leeds, Tozzer & Co., 92 Liberty St., New York, N. Y.
Myers & Bro. Co., F. E., Ashland, Ohio
*Ross & White Co., Chicago Daily News Bldg., Chicago, Ill.
*Weaver Mfg. Co., Springfield, Ill.
*Whiting Corp., Harvey, Ill.
Wolfe Brush Co., Pittsburgh, Pa.

WELDING and HARD FINISHING PROCESSES (Contract)

Automotive Generator Service, St. Louis, Mo.
Brodie System (B&J), Brooklyn, N. Y.
*Kerkling & Co., Bloomington, Ind.
Moguloid Co. of Amer., 1503 W. Van Buren St., Chicago 7, Ill.
Searles Electric Welding Wks., 1320 S. 47th St., Chicago, Ill.
Stark, Inc., Ralph, Long Island City, N. Y.

WELDERS, ELECTRIC and GAS

Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.
Allen Elec. & Eqpt. Co., Kalamazoo, Mich.
General Electric Co., Schenectady 5, N. Y.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland 1, Ohio
Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y.
Marquette Mfg. Co., Minneapolis, Minn.
Milburn Co., Alex, Baltimore, Md.
Peterson Welding Co., Kansas City, Mo.
Smith Welding Equipment Corp., Minneapolis, Minn.
Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Victor Eqlpt. Co., San Francisco, Calif.

WHEELS, GRINDING

American Emery Wheel Works, Providence, R. I.
Carborundum Co., Niagara Falls, N. Y.
Norton Co., Worcester 6, Mass.
*Van Norman Co., Springfield, Mass.

WRENCHES, END and SOCKET

Armstrong Bros. Tool Co., 317 N. Francisco Ave., Chicago 12, Ill.
Apco-Mossberg Co., Attleboro, Mass.
Billings & Spencer Co., Hartford 6, Conn.
*Blackhawk Mfg. Co., Milwaukee 1, Wis.
Bonney Forge & Tool Wks., Allentown, Pa.
Curtiss & Smith Mfg. Corp., Pottstown, Pa.
Herbrand Corp., Fremont, Ohio
New Britain Machine Co., New Britain, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Petersen Mfg. Co., De Witt, Neb.
Plomb Tool Co., Los Angeles 54, Calif.
*Snap-On Tools Corp., Kenosha, Wis.
Stevens Walden, Inc., Worcester, Mass.
Vichek Tool Co., Cleveland, Ohio
*Williams & Co., J. H., Buffalo 7, N. Y.

UNDISPLAYED RATE:
$1.20 a line, minimum 3 lines. To figure advance payments, count 5 average words as a line.
EMPLOYMENT WANTED AND INDIVIDUAL SELLING OPPORTUNITY undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.20 a line an insertion.

INFORMATION:
BOX NUMBERS count as one additional line in undisplayed ads.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.
EQUIPMENT WANTED OR FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE:
The advertising rate is $9.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. B.T.

NEW ADVERTISEMENTS received by 10 A.M. June 25th at the New York Office, 330 W. 42nd St., N. Y. 18, N. Y., will appear in the July issue subject to limitation of space available.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

GOOD SITUATION offered in a suburban operation, for a good mechanic experienced in bus maintenance including G.M. Diesel. Our fleet is small but practically all diesel. Write to P 9281, Bus Transportation, giving full details of past experience.

SHOP FOREMAN with experience on Diesel Buses to supervise maintenance inspection. Good pay is offered a capable and ambitious man. P 9748, Bus Transportation.

POSITIONS WANTED

EQUIPMENT SUPERINTENDENT, Bus, desires connection with progressive company, 22 years experience, age 54. PW 9089, Bus Transportation.

YOUNG MAN, married, age 28. Desires position as assistant to general manager or to Supervisory of Equipment. Has over three years experience as Gen. Mgr. and Supervisor of Equipment of small operation. Would like position in Southern Mass. if possible but will go elsewhere if necessary. Willing to work and interested in bus business. Bookkeeping and schedule experience. PW 9685, Bus Transportation.

AVAILABLE SOON. Capable Bus Executive seeks connection—possesses analytical ability to solve perplexing problems—am a diplomat and negotiator—have had considerable management and labor relations experience; age, in my forties—enjoy excellent health. PW-9500, Bus Transportation.

BUSINESS OPPORTUNITIES

SMALL BUS LINE for sale: 5 Parlor Coach busses. Intercity run and Charter Certificates. BO 9823, Bus Transportation.

FOR SALE — Suburban Bus Line Ind. PSCI & ICC Charter Certificates. 9 late type busses—Gross 30c per mile. Only 3 employees — Non Union. BO 9789, Bus Transportation.

BUS LINE FOR SALE. City, intercity franchise and established charter service in North Eastern Ohio fast growing industrial area. Fourteen units. Growing over $125,000 per year. BO 9936, Bus Transportation.

FOR SALE: City bus line serving Southern Wisconsin community of 25,000. Fleet of 11 Ford Transits. New garage and office building—132′ x 70′. Write BO 9934, Bus Transportation.

AIRPORT LIMOUSINE Franchise and Equipment for sale in City of 25,000 population protected by Public Service Certificate. At present time doing 75,000 business per year, and will increase 10 to 20% per year for the next 10 years. Golden Opportunity for young man of means. BO 9925, Bus Transportation.

FOR SALE

ONE PONY-CRUISER 1947 model 27 pass. K7 — International motor, good tires, very clean throughout. One Ford School Bus—Superior body 1942 model—38 Student capacity, new motor, in good shape. Write Rhinelander Bus Co., Rhinelander, Wisconsin.

EXCLUSIVE FRANCHISED operating suburban routes with equipment and personnel. NOW is the time to purchase this one.
C. O. THOMPSON
Charleston, S. C. P.O. Box 700

HELP WANTED

We need a top notch man to take charge of gasoline and diesel engine rebuilding shop of twenty men.

Machinist or mechanical engineer with proven record of supervision and reliability, completely familiar with all precision equipment, such as crank-grinders, line boring, fitting, assembly and final test.

We'll pay top money for man that can run the job efficiently and profitably. Location eastern Pennsylvania. Detail experience, background and age in reply. State availability. **P9803 Bus Transportation, 330 W. 42 St., New York 18, N. Y.**

FOR SALE
Bus Line
To Settle Estate

In growing community, operating in Ypsilanti, Michigan and to Willow Village. Grosses approximately $70,000 yearly. Contact Mrs. Frank Decker, 414 Howard St., Grand Haven, Michigan.

For Sale—Bus Brokerage Business.
Long established. Very profitable. Small investment. Also consider partnership.
Bo 9966 Bus Transportation
330 W. 42 St., New York 18, N. Y.

BUS LINE FOR SALE
Intercity bus franchise with ICC permit, located central U. S. Opportunity for small operator. Franchise with equipment less than $20,000.00.
BO 9923, Bus Transportation, 330 W. 42 St., New York 18, N. Y.

BUSSES FOR SALE
1942-29 Pass Buick Flexible Bus
1942-24 Pass Chevrolet Beck Bus
KERMIT HILTON,
Soldier, Iowa

FOR SALE
2—11 Passenger Sedans, 1—1947 and 1—1948, both Chevrolets.
4—7 Passenger limousines manufactured by Checker Mfg. Company, 1949 Models.
RED CAB INC.,
2020 N. Illinois St. Indianapolis, Indiana

FOR SALE
'47 25 pass. Pony Cruiser and
'49 Beck 28 pass. Rec. Seats, Clean.
'46 Ford 28 pass. and '40 Transit 6 late model school buses.
Arrow Bus Co., 2870 Holmes Ave. So., Minneapolis, Minn.; Tel. PI-1741

The largest selection of used
SCHOOL BUSES
IN WESTERN NEW YORK
Let us know your need.
COTTRELL BUS SERVICE, INC.
HObart 3000; day or night
BUFFALO 24, New York

Parts of all kinds for 27-R and 35-RL Twin Coaches at a big discount.
AUGUSTA COACH COMPANY
1515 Ellis Street Augusta, Georgia

GIVEN AWAY AT SACRIFICE PRICES
4—1946 Aerocoaches, 37 pass.
4—1947 Beck Mainliners, 35 pass.
6—1941-1946 Whites, 41 pass. Parlor Seats.
1—1948 Chevrolet 12 pass. Airport Coach.
2—1947 Flxible Airporters, 23 pass.
3—1948 Ford 29 pass. Transits.
FS 9843 Bus Transportation
330 West 42nd St. New York 18, N.Y.

BARGAIN
1—1941 28 pass. Superior, Avenue Model
2—1941 32 Pass. Superior, Avenue Model
10—Ohmer Model No. 90 Registers, $75 ea.
2—Ohmer No. 81 Registers.
A-1 Condition, Rear Exit Doors off White Buses
TRANS-BRIDGE LINES, INC.
Phillipsburg, N. J.

FARE BOXES FOR SALE

JOHNSON ELECTRIC AND MANUAL

CLEVELAND MODEL 5
Size 2

Excellent condition
IMMEDIATE DELIVERY

FRANK M. JUDGE
& COMPANY, Inc.
7010 Empire State Building
New York 1, N. Y.
LO. 5-7372-3

Attention . . . OPERATORS WITH SMALL COACHES

INCREASE YOUR REVENUE BY INCREASING CAPACITY

● We can lengthen your 32 or 36 passenger G.M.C. city service coaches . . . to 40 passenger size . . . We have performed this miracle on over 50 coaches for a large transit company with complete satisfaction.

WRITE • WIRE • PHONE for Full Details
Business Phone FE 4-7943
Resident Phone Pontiac FE 2-7448

NATIONAL COACH BODY
Repair Shop Pontiac, Mich.

Repair of GMC Accident and Fire Damage — Fleet Painting

Equipped to handle complete repairs. All work done by factory trained men.

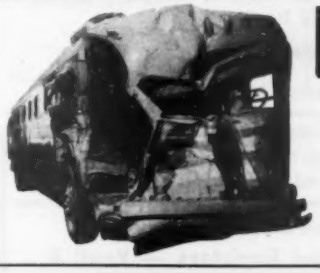
3121 West Huron, Pontiac, Mich.
Mgr. J. W. KUKLINSKI

Due to discontinuance of operations the following coaches are for sale, all in good operating condition, available June 1, 1951,

3—PD 2903 GMC Diesels
2—PD 2902 GMC Diesels
2—PD 2901 GMC Diesels
2—B 29 1947 Buick Flxibles
4—B 29 1945 Buick Flxibles

all 29 passenger coaches, reclining seats, with tires.

SERVICE STAGES, INC.
Atlanta, Georgia



GOOD AS NEW — QUICK! THE PERFECT WAY

Complete repairs on buses of all makes and models. We are fully equipped also to do a thorough painting, trimming and lettering job. For fast, competent, complete, economical service — write, wire or phone: Union 3-4602, Delaware 3-4122, Essex 3-1698.

PERFECT BODY & FENDER CO., INC.
6722 Hudson Boulevard West New York, N. J.

FLXIBLE-BUICKS

29 Passenger Recliners,
1944 and 1945

Immediate Delivery,
Priced to Sell

VERMONT TRANSIT LINES
Phone 3800 Burlington, Vt.

OH BOY! THAT "NEW BUS" LOOK!

WITH BERGEN BUS CUSHION REUPHOLSTERING

Top quality workmanship in the finest of modern materials such as Mohair — Koroseal — Naugahyde —Candalon — Nylon and others. *Ask our long list of satisfied customers about us.*

BERGEN AUTO UPHOLSTERY CO.
40 Glen Road Rutherford, New Jersey
Rutherford 2-8929

PROMPT, DEPENDABLE SERVICE
WRITE—WIRE—OR PHONE

1—1945 Model 29 pass. Flxible Coach is extra nice and is priced at $5500.00 with 7 tires. Refinished inside and out.

ARROW COACH LINES
Ottumwa, Iowa Phone 53

2—1945 MODEL 29 PASS. FLXIBLE COACHES

These units look as good as the day they were delivered. Much of these coaches you will find to be brand new. They have the Buick engine and are to be sold with good tires. The price is extra low for a quick sale.

FS 9831 Bus Transportation
330 W. 42nd Street New York 18, N. Y.

1—1941 Flxible 29 passenger with Buick motor.

2—1940 GMC PG 3701.

2—1941 GMC PD 2902.

1—1943 GMC PG 3301.

All buses are air conditioned; buses are in excellent condition and have just been taken out of service. Buses may be seen at Tulsa, Oklahoma.

Missouri, Kansas & Oklahoma Trailways
Cincinnati at Fourth Tulsa 3, Oklahoma

FOR SALE

25 782 31-PASSENGER WHITE COACHES

FOR PARTICULARS WRITE OR PHONE

W. J. Buck, Superintendent of Maintenance, Washington, Virginia & Maryland Coach Company, 707 North Randolph Street, Arlington 10, Virginia.

GLEBE 4000

BECK BUSES Sales and Service
G.M.C. USED BUSES
and all other makes
Completely Rebuilt throughout

BUS SALES CORP.
400 FOUNTAIN ST
PROVIDENCE, R. I.

WE BUY WE SELL

BUSES

RHODES

SINCE 1905

RHODES BUS & EQUIPMENT CO., INC.

TIMES BLDG., NEW YORK, N. Y. BRYANT 9-2584-5

'LEASING PAYS'

SALE OR LEASE

35 Pass. Beck Hi-Backs
24 Pass. Beck Recliners
29 Pass. Beck Transit
55 Pass. Brockway School
45 Pass. Mack School
25 Pass. Fitz Hi-Backs
19 Pass. CUB Transits

WILLETT BUS SERVICE, INC.

332 S. Michigan Ave. Chicago 4, Ill.

Telephone HArrison 7-6280

WANTED! R-10 & R-13 International Pass. Counters Cleveland Lock Boxes—

Available — Immediate Delivery

Johnson Electric & Manual Registers — Vault & Drawer Lock Boxes — Cleveland — Diamond Woods — Main

Call or Write—PURPLE SWAN—St. Louis 15, Mo.

WANTED

NEW AND USED BUSES

Bought and Sold

WOLFINGTON BODY CO., INC.

33rd and Arch Sts. Philadelphia, Pa.

Tel. Baring 5252

WANTED TO BUY

10—44-passenger city type ACF

or

10—44-passenger city type White Coaches

W 8564, BUS TRANSPORTATION,

330 West 42nd Street,

New York 18, New York

FOR SALE

4—1946 28 Passenger Model 510 FitzJohn Duraliner $4,500.00 each

3—1947 Hess and Elsenhardt 11 Passenger Cadillac Airporter's .....$1,000.00 each

A-1 Condition Used In Airport Service

AIRLINES TRANSIT CORPORATION

1034 Clark Avenue

St. Louis 2, Mo.

BUSES WANTED FOR EXPORT

Cash for Late Models

Ross Slack — Export Dept.

Consolidated Bus & Equipment Co.

420 Lexington Avenue

New York City Mu 3-9297

CUB COACHES

16 to 31 passengers

City and Intercity models

Economical to buy and maintain

Southeastern Distributor

BRICKERT OIL CO., Farmville, Va.

At Your Service

—for bringing business needs or "opportunities" to the attention of men associated in executive, management, sales and responsible technical, engineering and operating capacities with the industries served by the following McGraw-Hill publications:

The SEARCHLIGHT SECTIONS of

Classified Advertising

American Machinist
Aviation Week
Business Week
Bus Transportation
Chemical Engineering
Chemical Week
Coal Age
Construction Methods and equipment
Electrical Construction & Maintenance
Electrical Merchandising
Electrical World
Electronics
Engineering and Mining Journal
E. & M. J. Metal & Mineral Markets
Engineering News-Record
Factory Management and Maintenance
Fleet Owner
Food Engineering
Nucleonics
Power
Product Engineering
Textile World
Welding Engineer

For advertising rates or other information address the

Classified Advertising Division

McGRAW-HILL PUBLISHING CO., INC.

330 W. 42nd St., New York 18, N. Y.

PRICED FOR IMMEDIATE SALE

14—1947 and 1948 10 PASSENGER HESS AND EISENHARDT AIRPORT COACHES.

EXCELLENT CONDITION, PAINTED GREEN — GOOD TIRES

DEALER'S PROTECTED, IDEAL FOR AIRPORT, HOTELS OR MOUNTAIN OPERATIONS.

MR. H. GRAZ
CAREY TRANSPORTATION, INC.
340 EAST 48th STREET
NEW YORK CITY PLaza 5-6400

BUY BUSES NOW

3 PD 2903 GMC Parlor coaches
2 PD 2902's—2 PD 2901's
1 29-Pass. ACF Parlor Coach.
1 38S Twin, 1947, excellent shape.
10 ACF's model C-36.
4 Flxibles—29 pass. 1945
2 Flxibles—29 pass. 1947
1 Beck Interurban type, 25 pass.
7 TG 2701, 1 TG 2706 City Transit Type, pusher, 270 engine, very clean.
10 44-pass. Twins, 1947-8, model 44D.
5 69B Ford Transits, 6 cyl. engines, just overhauled.

1945-46 and 48 Aerocoaches; Flxibles—25 and 29 pass.; Fitzjohn Duraliners and Falcons, ACF's, 733, 2701, 728 and various models of School Buses.

All Equipment immediately available. Don't delay.

GEORGE P. KEENA
1936 N. Clark St. Chicago 14, Ill.
MOhawk 4-3200

WE OFFER SUBJECT TO PRIOR SALE PROMPT DELIVERY

20 MACK C-41 1947, Very Clean.
10 FORDS, 1946 - 1947 - 1948.
10 BECKS, 1942/1947, Very Clean.
10 WHITES 788, 1944/1947, Very Clean.
20 WHITES 798, 1945/1948, Excellent Condition.
Several GMC 1204s—2405s and 2706s.
2 GMC TDH 3609—1946. Real Buy.
2 PDA 3703, Air Conditioned, Exceptional Condition.
6 FLXIBLES 29 passenger 1945/1947
5 GMC 2901/03 1944/1948

Used buses are getting scarcer every day. Buy now and avoid higher prices.

G.A. MacLEAN COMPANY
624 S. Michigan, Chicago 5, Illinois
Tel.: WAbash 2-6993

FORDS

11—Model 29-B 1945

Were Re-built with 6 cylinder motors

FRANK M. JUDGE & COMPANY, INC.
7010 EMPIRE STATE BUILDING
NEW YORK 1, N. Y.

NEW CHEVROLET

12 PASSENGER SEDAN COACHES

Call Write Wire

Queen City Chevrolet Co.
CINCINNATI, OHIO PA. 4880

50	Beck	29 pass. Diesel
50	Beck	29 pass. Gas
49	Beck	37 pass. Diesel
49	Beck	37 pass. Gas
47	G.M. 29 & 33	pass. Gas & Diesel
47	Fitzjohn	28 pass.
43	Fitzjohn	35 pass. transit
44	Aerocoach	37 pass.
42	Aerocoach	37 pass.

Let us know what coaches you need and what coaches you have to dispose of.

BRICKERT OIL CO.
Phone 283 Farmville, Va.

YOU'RE LUCKY

To find a Company that has on display at all times a big selection of New and Used Buses. Let us know your needs.

McLaughlin Bus & Equipment Co.
1224 No. Main Street
Providence 4, Rhode Island

FOR SALE

TRANSIT

3 ACF—44 Pass., 2 Doors, 1948
2 MACK—37 Pass., 2 Doors, 1948-49
10 MACK—32 Pass., 2 Doors, Model LC 1942
20 YELLOWS—36 Pass., Model 3610, 3609, 3606, 1944-47 Gas and Diesel.
2 BEAVERS—36 Pass., 1947
20 WHITES—37-45 Pass., Model 788, 798
25 FORDS—27 and 29 Pass., 1945-1948
10 WHITES—Model 782, 31 Pass. 2 Door

DELUXE

15 ARROW COACHES—37 Pass., 1942 through 1949.
7 ACF—37 Pass., 1940-42
5 BECKS—29 to 37 Pass.
10 FLEXIBLES—25-33 Pass., 1941-48
7 YELLOW DIESELS—33 Pass., 1945
5 YELLOW DIESELS—37 Pass., 1941-47
10 YELLOW GAS—29-37 Pass., 1942-45

VAN LOAN
EQUIPMENT and BUS CO., INC.
Hotel Sherman Square
2839 Broadway, New York City, N. Y.
TRafalgar 7-6789 - 6790 ENdicott 2-8400

IMMEDIATE DELIVERY

1948 Reo School Bus	43 Pass.
1942 Reo School Bus	60 Pass.
1948 Ford School Bus	48 Pass.
1951 Dodge School Bus	60 Pass.
1951 White School Bus	60 Pass.
1951 Reo School Bus	60 Pass.
1950 Int. Metro Bus	16 Pass.

NATIONAL BUS SALES CO., INC.
101 No. 33rd St. Philadelphia 4, Pa.
BAring 2-7605

USED BUSES FOR SALE:

1941 P.G. 2505—Yellow Parlor Coach—29 pass. $1500.00
1947 Ford Conventional, Headrest Seats, Luggage racks, 25 pass. $1200.00

BRYANT BUS LINE
Cor. Broad & Blair Sts. Grove City, Pa.

For Sale: 10 thoroughly reconditioned 27-passenger Ford Transit buses, six cylinder engines. Guaranteed to be in good condition. At reasonable prices.

SUBURBAN LINES
981 Ashby St., N. W. Atlanta, Georgia

ADVERTISERS IN THIS ISSUE

AC Spark Plug.....8, 103, 107
Adams & Westlake Co., The..... 106
Aeroquip Corp..... 203
Albertson & Co., Inc..... 139
Aluminum Co. of America..... 16
American Brakeblok .....Second Cover
American Chain & Cable Co., Inc..... 110, 194
American Diesel Service..... 212
American Liquid Gas Corp..... 209
American Seating Co..... 183
Arco Company, The..... 122
Arrow Safety Device Co..... 198
Auto-Lite Battery Corp.....108-109
Automotive Generator Service..... 216

Beck & Co., C. D..... 129
Bendix Westinghouse Automotive Air Brake Co..... 19
Bendix Zenith Carburetor Co..... 181
Bennett-Feragen, Inc..... 100
Blackhawk Mfg. Co..... 169
Breeze Corporations, Inc..... 200
Brunner Mfg. Co..... 197
Budd Company, The.....200, 201
Buell Mfg. Co..... 210

Carborundum Co..... 161
Champion Spark Plug Co..... 2
Cities Service Oil Co..... 13
Clark Equipment Co.....Insert 105-106
Cleveland Graphite Bronze Co., The.. 199
Consolidated Car Heating Co., Inc..... 170-171
Cummins Engine Co., Inc..... 111
Curtiss & Smith Mfg. Corp..... 189

Dayton Rubber Mfg. Co., The..... 102
Delco Batteries..... 168
Delco Products..... 130
Delco-Remy Corp..... 154
DeLuxe Products Corp..... 176
DeVilbiss Co., The..... 15
Dietz Co., R. E..... 140

Earll Co. Inc., C. I..... 215
Edwards Co. Inc., O. M..... 113
Electric Service Mfg. Co..... 135
Electric Storage Battery Co..... 97

Federal Mogul Service.....158, 185
Firestone Tire & Rubber Co., The.... 177
Flour City Brush Co..... 210
Fixible Co., The..... 112
Fram Corp..... 131

Gates Rubber Co., The..... 141
General American Aerocoach Co....28-29
Globe Hoist Co.....150-151
GMC Truck & Coach.....Insert 9-12
Goodall Fabrics, Inc..... 164
Goodrich Co., The B. F..... 32
Goodyear Tire & Rubber Co., Inc., The..... 3
Grey-Rock Division of Raybestos-Manhattan, Inc..... 119
Guide Lamp..... 184
Gulf Oil Corp..... 136
Gunite Foundries Corp.....152-153

Hercules Motors Corp..... 115
Heywood-Wakefield Co..... 192

Inland Mfg..... 163
Ionia Mfg. Co..... 31

Johns-Manville Corp..... 25

Karpen & Bros., S..... 127
K. C. Fountain Brush Co..... 217
Kinnear Mfg. Co., The..... 205
Koppers Co., Inc., American Hammered Piston Ring Dept..... 146

Leece Neville Co..... 26
Leyland Motors, Ltd..... 18
Long Mfg. Division Borg-Warner Corp..... 114
Luminator, Inc..... 178

Mack Mfg. Co.....Insert 123-126
Magnus Chemical Co.....212
Markel Service, Inc..... 118
Marmon-Herrington Co., Inc. Insert 22-23
Meyer & Wenthe, Inc..... 213
Midland Steel Products, The..... 182
Minneapolis-Honeywell 159
Money-Meters, Inc..... 217
Moraine Products..... 174
Moore and Co., Samuel..... 7
Moto-Card Co., The..... 210

National Automotive Parts Association..... 138
National Pneumatic Co..... 6
National Seating Co..... 101

Oakite Products, Inc..... 147
Ohio Brass Co..... 134

Packard Electric Corp..... 30
Perey Turnstile Co..... 219
Perfect Circle Corp.....Front Cover
Phillips Petroleum Co..... 99
Pittsburgh Plate Glass Co..... 167
Pullman-Standard Car Mfg. Co..... 193

Quaker State Oil Refining Corp..... 21

Raybestos Division of Raybestos-Manhattan, Inc..... 157
Remington-Rand 187
Rigidized Metals Corp..... 196
Rockwell Register Corp..... 98
Rohden Mfg. Co..... 143
Ross Gear & Tool Co..... 17
Russells Guides, Inc..... 219

Saginaw Steering Gear..... 175
Schrader's Son A..... 142
Sealed Power Corp.....Insert 27, 33
Shephard-Thomason Co. 204
Sinclair Refining Co.....172-173
Snap-on Tools Corp..... 155
Socony-Vacuum Oil Co., Inc.....120-121
Spicer Mfg. Co..... 24
Sprague Devices, Inc..... 128
Standard Oil Co. (Indiana)...Back Cover
Standard Oil Co. of California..... 149
Standard Pressed Steel Co..... 213
Stewart-Warner Corp. 211

Texas Company, The..... 4-5
Thermoid Co..... 148
Timken Detroit Axle..... 14
Timken Roller Bearing Co., The..... 20
Toledo Steel Products Co., The...206, 207
Transit Buses, Inc.....116-117
Transportation Sash Co., Inc..... 190
Tru-Car Inc..... 208
Twin Coach Co.....Insert 144-145

United Motors Service..... 160
Upholstery Leather Group, The..... 188

Vapor Heating Corp..... 137

Wagner Electric Corp.....104, 133
Weaver Mfg. Co..... 132
Westinghouse Air Brake Co.....202
White Motor Co.....Insert 34
Whiting Corp..... 191
Wilkening Mfg. Co..... 156
Willard Storage Battery Co. Third Cover
Wix Accessories Corp..... 162
World Besten Corp..... 165

Zollner Machine Works..... 186

★

SEARCHLIGHT SECTION

(Classified Advertising

★

EMPLOYMENT
Positions Vacant 220
Positions Wanted 220

SPECIAL SERVICES
Contract Work 221

BUSINESS OPPORTUNITIES
Offered 220

EQUIPMENT
(Used or Surplus New).....220-223

WANTED
Equipment 222

ADVERTISERS INDEX
Airlines Transit Corp..... 222
Arrow Coach Lines..... 221
Augusta Coach Co., Inc..... 220
Bergen Auto Upholstery Co..... 221
Brickert Oil Co.....222, 223
Bryant Bus Line..... 223
Bus Sales Corp..... 221
Carey Transportation, Inc..... 222
Consolidated Bus & Equipment Co.... 222
Cottrell Bus Service, Inc..... 220
Decker Bus Lines..... 220
Golden Valley Sales & Equipment Co. 220
Hilton, Kermit 220
Judge & Co., Inc., Frank M.....221, 223
Keena, George P..... 223
MacLean Co., George A..... 223
McLaughlin Bus & Equipment Co.... 223
Missouri, Kansas & Oklahoma Trailways 221
National Bus Sales Co., Inc..... 223
National Coach Body Repair Shop... 221
Perfect Body & Fender Co., Inc..... 221
Purple Swan Transportation Co..... 222
Queen City Chevrolet Co..... 223
Red Cab Incorporated..... 220
Rhodes Bus & Equipment Co., Inc.... 222
Service Stages, Inc..... 221
Suburban Lines 223
Thompson 220
Trans-Bridge Lines, Inc..... 220
Van Loan Equipment Bus Co., Inc.... 223
Vermont Transit Co., Inc..... 221
Washington, Virginia & Maryland Coach Co. 221
Willett Bus Service, Inc..... 222
Wolfington Body Co., Inc..... 222

This index is published as a convenience to the readers. Every care is taken to make it accurate, but Bus Transportation assumes no responsibility for errors or omissions.

Willard Quality...

GIVES YOU

3 BIG ECONOMY EXTRAS

The value of Willard quality has been proved again and again during the past 47 years. It gives the Willard Battery you buy 3 big economy extras . . . *extra* dependability . . . *extra* performance . . . *extra* long life. For low cost per mile on every battery job . . . buy a Willard. They're sold and serviced throughout the United States and Canada.

BWG Types for Buses and Motor Coaches with 12-volt starting, lighting, and ignition.

WILLARD STORAGE BATTERY COMPANY

Cleveland • Los Angeles • Dallas
Memphis • Portland • Toronto

Now, greater protection for harder working heavy-duty fleet engines

New and better...

STANOLUBE HD-M

REG. U. S. PAT. OFF.

Motor Oil

For nine years, STANOLUBE HD Motor Oil has demonstrated its ability to cope successfully with the most difficult problems of lubrication in automotive diesel and heavy-duty gasoline engines. Now, all of the outstanding qualities of this product have been incorporated in a new and better heavy-duty lubricant: STANOLUBE HD-M Motor Oil.

In extensive field tests, new STANOLUBE HD-M has proved its ability to benefit harder working heavy-duty fleet engines these two ways:

1. Extends engine life. Because of improved detergent-dispersant action, new STANOLUBE HD-M keeps engines clean under severe conditions imposed by adverse fuel quality, higher operating temperatures, and prolonged periods of hard operation. Freedom from harmful deposits means less wear, longer life for fleet engines.

2. Reduces maintenance. Because it has greater oxidation stability, new STANOLUBE HD-M helps keep pistons, rings and valve stems free from varnish-like deposits caused by oil oxidation and provides protective films of oil in the face of high operating temperatures. Less wear of engine parts, longer periods between overhauls mean less overall maintenance.

A Standard Oil lubrication specialist can help you obtain maximum lubrication benefits from STANOLUBE HD-M. To reach him, just phone your local Standard Oil Company (Indiana) office.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

A Complete Line of Motor Oils for Every Heavy-Duty Service Need

STANOLUBE HD-M is recommended for all internal combustion engines. It meets U. S. Army specification MIL-0-2104. This lubricant provides excellent cleanliness, low wear rate, and low oil consumption under severe operating conditions. Available in all SAE grades.

STANOLUBE S-1 is recommended for use in automotive, diesel, or gasoline engines where other heavy-duty oils cannot control deposits caused by operational severity or adverse fuel quality. It meets requirements of MIL-0-2104 and the requirements for "series 1" type oils as well. Available in all SAE grades.

STANOLUBE HLA is recommended for use in supercharged diesel engines and in other engines that operate under the most adverse conditions. It meets the requirements of MIL-0-2104 and the requirements of "series 2" type oils. Available in SAE 10 and SAE 30 grades.

STANDARD OIL COMPANY (INDIANA)

STANDARD